TRANSACTIONS

OF THE

Massachusetts Horticultural Society,

FOR THE YEAR 1889.

PART I.

BOSTON:
PRINTED FOR THE SOCIETY.
1890.

☞ SEE LAST PAGE OF COVER.

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The following papers and discussions have been circulated to some extent in the form of slips reprinted from the reports made by the Secretary of the Society in the Boston Transcript. As here presented, the papers are printed in full, and the discussions are not only much fuller than in the weekly reports, but, where it appeared necessary, have been carefully revised by the speakers.

The Committee on Publication and Discussion take this opportunity to repeat what they have before stated, that the Society is not to be held responsible for the certainty of the statements, the correctness of the opinions, or the accuracy of the nomenclature in the papers and discussions now or heretofore published, all of which must rest on the credit or judgment of the respective writers or speakers, the Society undertaking only to present these papers and discussions, or the substance of them, correctly.

O. B. Hadwen,
William H. Hunt,
Francis H. Appleton,
} *Committee on Publication and Discussion.*

TRANSACTIONS

OF THE

Massachusetts Horticultural Society.

BUSINESS MEETING.

SATURDAY, January 5, 1889.

A duly notified stated meeting of the Society was holden at 11 o'clock, the President, Henry P. Walcott, in the chair.

This being the commencement of the term of office of the new board of officers and standing committees, the President delivered the usual inaugural address as follows:

Members of the Massachusetts Horticultural Society:

Ladies and Gentlemen:— The financial condition of the Society during the past year will be submitted to you by the Treasurer in his annual report.

It will be found that the account is still a favorable one. The funds for the payment of the outstanding indebtedness of the Society are steadily increasing, and our mortgage debt, deducting therefrom the amount of the sinking fund, has been reduced to twenty thousand dollars. The rents of the stores in the basement and first story have been raised in amount by satisfactory leases to responsible tenants for a term of years. The external appearance of the lower portion of the building has been improved by some alterations of a permanent character made at the expense of the Society, but to be practically repaid by the tenants in equal annual instalments.

It is too early yet to state definitely the loss to the Society caused by the fire of the 30th of December, 1888.

The origin of the fire was in an act of stupid carelessness on the part of a person not connected with the Society, and we have every reason to congratulate ourselves upon the escape of the building and its contents from entire destruction. The fire department of the city of Boston acted promptly, wisely, and energetically, and we owe it a debt of gratitude for duty well done, for which, in your name, I offer to the proper authorities our hearty acknowledgements.

Losses by fire are covered, so far as they can be, by ample insurance; but we have been deprived of possessions which money alone cannot replace. The cherished portraits of men eminent in the history of this association, which were the adornments of our halls, are, with few exceptions, ruined. The Society will so be compelled to forego for a number of weeks the customary uses of the halls and of the revenue derived from them.

Mr. George W. Fowle, who has held the office of treasurer since June, 1881, retired from that office on the first day of the present year, and has been succeeded by Mr. W. Wyllys Gannett. Mr. Fowle has had the good fortune to see, during his term of service, the immediate debt of the Society, amounting to more than seventy thousand dollars, reduced to less than twenty thousand. He deserves much credit for his share in this work. He has given to us an honest, patient, and devoted service, and we wish him a long enjoyment of his well earned leisure.

The question of a final arrangement of this building, so that it may yield an income sufficient for the purposes of this organization, on the one hand, and on the other give space for our exhibitions and room for the decent accommodation of our library, has not yet been answered.

The subject has been carefully considered by a committee to which it was formally referred by the Society, and it is hoped that a report may soon be made which will contain some definite recommendations upon this subject.

The exhibitions of the past year do not appear, as a whole, to have quite reached our usual standard of excellence. The falling off was more noticeable in the exhibitions of plants and flowers, and though the unfavorable season may explain to a certain extent the deficiency, it was evident that a number of the largest exhibitors of preceding years were not represented. While we hope that our oldest exhibitors have not permanently withdrawn from

the competitions and shows, it is nevertheless satisfactory to see the many evidences of skill and taste displayed by the new comers, and to know that a younger generation is, in turn, to enter into the friendly rivalry which has contributed so much to the horticultural successes of this time. The question naturally arises in this connection — How can the exhibition of new and interesting specimens of plants, fruits, and flowers be best promoted? As the amounts of money awarded by us in prizes are apparently equal to those which, under similar conditions elsewhere, are found to be ample for the purpose of promoting exhibitions and arousing competition, we may conclude that some other attending circumstances are not favorable. The statement has been made in the horticultural press of other countries, and it may be equally true here, that the higher prizes, as medals and certificates of merit, do not carry with them that suggestion of a deliberate judgment exercised by a collection of competent judges which is desirable. It does appear to be the fact that even in the case of the large and well constituted flower committee of the Royal Horticultural Society, these awards have been made by a very small portion of the whole committee. Therefore, various propositions have been made for the purpose of securing a more satisfactory bestowal of these prizes. The suggestion made is this: that the qualities of excellence in the specimen under consideration by the judges should be distinctly stated in writing, this statement to be subscribed by a majority, at least, of the full committee.

The preparation of this written statement might very properly be committed to two or three experts in the class of plants brought before them, and it would not be necessary that this sub-committee should be drawn from the members of the prize committee. It is only necessary that they should be well-recognized authorities in their respective specialties, and that their functions should be limited to the preparation of the preliminary report. The prize committee should then take such action upon the sub-committee's report as may appear best to them. We should then secure in the first place the opinion of a specialist,— and no committee of reasonable size will contain men entirely competent to decide upon the merits of all specimens submitted to them — and in the next place, we should have the revision of the specialist's opinion by those not limited in their tastes and acquirements, but who

can compare the object before them not only with all of its own kind but also with all other kinds. The specialist might, and probably sometimes would, recommend something from his own limited point of view, which the larger committee, from a wider survey, would wisely reject.

It is also desirable that some arrangement should be made so that persons having new or interesting plants, flowers, or fruits might be enabled to place them on exhibition in this building at any time — without reference to our regular shows — if it prove more convenient. A provision should be made for the proper care of the specimens and an official recognition of their merits. The establishment of informal exhibitions of this kind would bring our members more frequently to these halls, and indirectly promote that better personal acquaintance which would benefit us all.

Some expressions of opinions have been heard here and elsewhere, during the past year, upon the supposed undue prominence given to fruits and vegetables in the prize schedules of the Society. If it is only intended by this criticism to suggest that some one fruit or vegetable receives a disproportionate share of the awards there is not much to be said in reply.

It is probably as true of our schedule, as it is of the national tariff, and we may anticipate a satisfactory agreement upon the relative claims of the various articles upon our prize lists as soon as,— may I express the hope, a little earlier than,— our national legislators have brought their own labors in this field to a happy conclusion.

But if it is meant that fruits and vegetables should as a class receive proportionately less of the Society's attention and rewards than plants and flowers receive, then it does seem to me that the purposes of the founders and promoters of the Massachusetts Horticultural Society have been lost from sight. It is beyond question true that they regarded the cultivation of fruits as the most important object of interest to the young Society, and the intelligent public shared this belief. It may almost be said that one fruit, the pear, was for years the principal object of interest. Fortunately, as years went by, their horizon was extended and the whole field of horticulture was open to them. But it is nearly as important now as it was sixty years ago to encourage the production of new varieties of cultivated fruits and vegetables.

In the opinion of many intelligent observers the lives of these improved varieties are neither long nor certain. We retain still upon our schedules the names of fruits of the highest quality which are not now to be found in this Commonwealth, which would be brought to our exhibitions if they were in existence here.

It is certainly a wise thing that we should endeavor to obtain improved varieties of fruits and vegetables; it is proper that we should bestow large rewards upon the skilful horticulturist who produces them, and we may have gained something even if these varieties are found to be only as good as those now in existence, for they will possibly have the better vitality belonging to a new stock, or a closer adaptation to the peculiarities of our climate and soil.

The production of a new plant or flower adds much to the pleasure of the raiser and is a distinct addition to our means for making our surroundings more attractive, and will never surely be neglected in any condition of civilized society, however much it may be stimulated, from time to time, by prizes and awards. But he who enters upon the task of raising a new and better vegetable or fruit should have all the encouragement possible in his long and patient labors, and should receive at the fortunate conclusion of his work, the larger reward which belongs of right to him who has added not alone to the pleasures of man but to the means of subsistence of the human race.

Our art daily teaches us that in the best garden even, nothing but the useless weed grows without constant care. This Society has been brought to its present condition of success and usefulness by the earnest work of this and preceding generations; we must continue their unremitting toil if this garden of ours is to remain fair and prosperous in the land, a monument of the patient struggles of the fathers and the well sustained activities of the sons.

The President, as Chairman of the Executive Committee, reported a recommendation that the Society make the following appropriations:

For Prizes for the year 1889, ...	$6,000
For the Library Committee, for the purchase of magazines and newspapers, binding of books and incidental expenses of the Committee, ...	300

For the same Committee, to continue the Card Catalogue of Plates,	$100
For the Committee on Publication and Discussion,	250
For Prizes for Window Gardening,	150
For the compensation of the Secretary and Librarian and his Assistant,	1,700
For the salary of the Assistant to the Secretary and Librarian, to supply the deficiency for the year 1888,	25
For the Committee of Arrangements, this sum to cover all extraordinary expenses of said Committee,	300

The Executive Committee also recommended that the expenditure of $12.95, by the Committee of Arrangements, in excess of the appropriation for the year 1888, be paid out of the appropriation for the year 1889.

The report was accepted, and the appropriations were unanimously voted.

The Executive Committee also reported the appointment of Robert Manning as Secretary and Librarian, and W. Wyllys Gannett as Treasurer and Superintendent of the Building.

The Executive Committee also reported, in regard to the letter of C. Harman Payne, Foreign Corresponding Secretary of the National Chrysanthemum Society of England, referred to the Committee at the meeting of this Society on the 1st of December, that no action is expedient. This report was accepted.

The same Committee presented the following report:

The Executive Committee, after due investigation of the recent amendment to Section XXXIII, of the Constitution and By-Laws, adopted at the stated meeting on the 6th of October, 1888, by which the award of prizes offered by the Massachusetts Horticultural Society is restricted to members of the Society, unanimously recommend to the Society that, as the said amendment conflicts with the provisions of the State Statutes, said Section XXXIII be restored, by striking out the words, "Prizes may be awarded to any member of the Society and," and substituting the words, "Prizes or," so that the Section shall commence as follows:— "Prizes or gratuities may be awarded to any person."

The amendment had two readings, and receiving a majority of votes was ordered to be entered on the records for consideration at the stated meeting in April next.

The Annual Report of the Garden Committee was read by John G. Barker, Chairman, accepted, and referred to the Committee on Publication and Discussion.

Frank W. Andrews proposed the following amendment to the Constitution and By-Laws:

Strike out the whole of the first section, relating to the officers of the Society, and insert the following:

"The officers of the Society shall consist of a President, four Vice Presidents, a Treasurer, a Corresponding Secretary, and a Recording Secretary, who shall be chosen by ballot, and shall hold their offices for one year, and until others are chosen in their stead; provided, however, that no person shall be eligible to any office unless he shall have been a member for the term of three years previous."

This amendment had two readings, and receiving a majority of votes was ordered to be entered on the records for consideration on the first Saturday in April.

O. B. Hadwen, Chairman of the Committee on Publication and Discussion, stated that though that Committee had not yet completed the Programme of Meetings for Discussion the present season, the work was well advanced, and announced for the next Saturday, at half past eleven o'clock, a paper on the "Evolution and Variation of Fruit Plants, and their Tendency to Degenerate when Cultivated," by Joseph H. Bourn, of Providence, R. I., Ex-President of the Rhode Island Horticultural Society.

Benjamin G. Smith, Treasurer of the American Pomological Society, announced that the Twenty-Second Biennial Session of that Society would be held at Ocala, Florida, on the 20th, 21st, and 22nd of February next, and invited all so disposed to become members of the Society and attend the meeting. On motion of Mr. Smith it was voted that the Chair appoint a committee of five to report a list of delegates.

William E. Endicott, Chairman of the Library Committee, presented the following amendment to the Constitution and By-Laws, proposed by that Committee:

That the words, "have control of the Library Room and shall" be inserted after the words, "They shall" in the second sentence of Section XVIII; so that the sentence shall read "They shall have control of the Library Room and shall cause the Library to be opened for the use of members during business hours, and at such other times as they may deem expedient." This amendment had two readings, and receiving a majority of votes was ordered to be entered on the records for consideration on the first Saturday in April.

Mr. Endicott also laid before the Society, a copy of the new quarto edition of the "Rose Garden;" also "Roses and Rose Culture," and "Roses in Pots;" a donation to the Library by the author, William Paul, of Waltham Cross, Hertfordshire, England, a Corresponding Member of this Society, and moved that the thanks of the Society be presented to Mr. Paul for his valuable present, which motion was unanimously carried.

It was voted that the offer of a prize for the best plantation of timber trees, in compliance with the laws of the Commonwealth, relating to Agricultural Societies, be confirmed.

Also, voted that the Committee on Publication and Discussion, be requested to award the prizes offered for the best reports by Awarding Committees.

The following named persons, having been recommended by the Executive Committee for membership in the Society, were on ballot duly elected:

James P. Dillon, of Jamaica Plain,
J. Henry Brooks, of Milton,
Francis Jackson Ward, of Roxbury,
William F. Day, of Roxbury.

Adjourned to Saturday, January 12, 1889, at half-past eleven o'clock.

BUSINESS MEETING.

SATURDAY, January 12, 1889.

An adjourned meeting of the Society was holden at half-past eleven o'clock, the President, Henry P. Walcott, in the Chair.

On motion of John G. Barker, it was voted that a committee of five be appointed by the President, to consider the suggestions made by him in his Annual Address, delivered on the preceding Saturday, and Mr. Barker, William C. Strong, William H. Spooner, Charles H. B. Breck, and Francis H. Appleton were appointed as that Committee.

The President stated in regard to the damage to the building by fire on December 30, 1888, that he thought the sum to be received from the insurers would be sufficient to restore the building as it was before the fire. The Inspectors of Buildings would not, however, be satisfied with such a restoration, but would require greater safeguards against fire than had previously existed, and the manner in which the fire passed from one part of the building to another made it evident that such safeguards are needed. He suggested that the Finance Committee be authorized to incur the expenditures necessary to make such changes as might be required.

William C. Strong moved that the Finance Committee have power to make such alterations as the Inspectors of Buildings might require.

Nathaniel T. Kidder moved to amend Mr. Strong's motion by providing for a larger committee. The amendment was accepted by Mr. Strong, and it was voted that a committee of seven, including the Finance Committee be appointed by the Chair to consider the subject of repairs and alterations. The Chair appointed as the additional members of the Committee, James F. C. Hyde, Nathaniel T. Kidder, Frank W. Andrews, and E. W. Wood.

On motion of O. B. Hadwen, it was voted that photographs of the portraits belonging to the Society be taken for use in case of loss.

Adjourned to Saturday, January 19, 1889.

MEETING FOR DISCUSSION.

The Evolution and Variation of Fruit Plants; their Tendency to Degenerate, when Cultivated.

By Joseph H. Bourn, Ex-President of the Rhode Island Horticultural Society, Providence, R. I.

Knowledge of fruit bearing plants that were on the earth before the commencement of the historical era is very limited. Ancient writers did not make us acquainted with species of fruits in countries that had no literature or archæological records; and information imparted without giving botanical facts would have been of but little value in comparison with the more advanced ideas of modern naturalists. Besides, biological science has outgrown the views bequeathed to us by Aristotle, Theophrastus and Galen. There is no record how long the impenetrable forests of date palms have been growing in the solitary wilds of Arabia, or how early the wild pomegranate blossomed in the green gloom of the woods of Asia Minor; but burnt apples and pears, cherry stones and beech nuts, have been found in the lake dwellings of Lombardy, Savoy, and Switzerland; seeds of grapes have been discovered near Parama and in the remote settlements of Lake Varese, and vine leaves in the tufa near the French city of Montpelier. One of the oldest examples of fruits, is represented in a drawing of figs found in the Egyptian pyramid of Gizeh. Fig flowers are spoken of as offerings in the days of the Rameses; and woods of dates surrounded by pathways of red fruits, were luxuriant ornaments in the temple gardens of Egypt. Peaches, plums, currants, bananas, olives, gooseberries, and pineapples were wild species long before they were brought under domestication; and although no traces of our fruits proper have ever been discovered in the primary and secondary fossiliferous periods, it is probable that the vegetation which characterized the close of the tertiary epoch was nearly identical with that existing at the present day, under the same climatic conditions. During the age of conifers, plum-like stone fruits resembling those of the yew were deposited in sandstone beds of the upper coal formations. Trees belonging to the genus Prunus have been discovered among the Miocene plants. Figs are included among the Eocene; and although there are traces of the preservation of but few fruit

species, it must not be inferred that others did not exist, as only a few plants have external substances capable of resisting decomposition. The loose vascular and cellular tissues of the earliest vegetation readily decomposed and were therefore difficult of fossilization.

The story of the life of fruit plants has been interrupted by long periods of time; yet there is substantial evidence that fruit trees have usually accompanied the migratory progress of civilization. As long ago as the time of the Crusades, the Romans brought fruit trees, that they did not previously possess, from western Asia, and names were erroneously given. The peach was called the Persian apple; the cashew the mahogany apple; the pomegranate the apple of Cartharge. Dr. Lindley grew three raspberry plants from seeds discovered buried thirty feet below the surface of the ground and which, it is assumed, had retained their vitality seventeen hundred years. Seeds of beach plums have been found in Maine in a stratum of sand twenty feet from the surface, and trees have sprouted from the earth upon which the sand had been strewn. Fruit germs may have retained their vitality buried beneath the glacial rubbish, as seeds are occasionally found thus reposing in a dormant condition. Wild species sometimes appear in situations where they have been previously unknown, but after a change has been produced in the physical state of the soil. The drift deposits may have been the vast granary in which Nature preserved her store of seeds through the long rigors of a geological winter.

Historical time is regarded as so small a fraction of the age of the earth, as to make the date of the origin of fruit plants obscure; but an early development of flowers must have taken place in order to perpetuate the species; and Nature must have cared for the pulp of the fruit sufficiently to protect the inner seed and assist in its development and distribution. The long series of fossiliferous deposits which form the connecting links between the present and the remote past have demonstrated that different specific and generic types of vegetable life followed one another in successive periods; that fruits with which we are familiar were not always in existence but were preceded by numerous races differing from them. At a certain definite period the life of a fruit plant had a beginning. It is probable that its existence depended on parental rather than spontaneous generation, yet the

conditions may have been entirely different from those existing at the present time. The buried geological organisms are now looked upon as the ancestors from which have been derived the rich diversity of fruit forms of the present age. These have been developed in their successive generations by the necessary accommodation to the ever-changing and progressive conditions of life. The mysterious development of the primitive fruits is the expansion of that which was invisible into visibility. Their life may be regarded as purely a physical phenomenon, dependent on mechanical and chemical causes inherent in the nature of matter. In the beginning no vegetation clothed the earth's crust, but the decomposing influence of the atmosphere has taken effect upon inorganic matter to such a degree as to develop vegetation in sufficient quantity for the present economy of the world. The plant growth of the carboniferous era was luxuriant and abundant, but mostly flowerless and fruitless. The club-mosses were then a magnificent group, never surpassed in their development. The universal diffusion of lichens which disintegrated the hard and barren rocks prepared an organic soil in which higher orders of vegetation could exist. Their powdery crusts and little colored cups were formed from the particles of sand into which they crumbled the surface of the rocks, and by their own decaying tissues they produced a thin layer of mould for the sustenance of the simplest mosses. These added their contribution of withered leaves to increase the film of soil. The decay of gigantic ferns, palms, and reeds supplied the soil with humus, and made material necessary for the development of the succeeding generations of fruit plants. Lycopods and ferns doubtless led the way from the flowerless plants to the flowering pines and firs; and so, from the lower to the higher forms of organized structures, progression from the general to the special attributes of organic bodies is shown to be a law of organization. Plants of a higher order gradually succeeded each other, each series contributing to, and assisting to prepare a soil for the future growth of its own and other species, from the loose and incoherent mass of decaying tissues, sand, and disintegrated soil which previous occupants had left behind.

It has been demonstrated that for an indefinite period vegetable life existed and perished; that destruction of the individual as that of species has taken place, and that while the death of a

plant was balanced by generation, its extinction has been concomitant with the Creative power which has continued to provide a succession of species. But palæontology does not teach the law according to which species of fruits have been introduced. Their mysterious introduction is veiled from us and can never be penetrated, except it can be traced in the gradual departure of varieties from the type of the species. The principle adopted by Nature, which seems to produce permanent useful varieties, and then species afterwards, under wider divergencies perhaps, is the principle of selection. Nature is so orderly and systematic that every race is continued by those individuals that are best adapted to the circumstances of the day; and in this way is preserved in harmony the grand scheme of creation, according to which life is everywhere present, and is always tending to higher forms of development when circumstances are favorable.

The investigation of the development of a fruit plant leads us directly then to the germ from which it springs. Commencing with a simple cell, it is impossible to tell what form it is destined to take, its vitality cropping up like some unseen but felt presence that hovers around the biological secret. The life history of a fruit plant shows a complex collection of manufactories and organizations; but the structure of the germ acquired by natural selection seems to be completely sufficient for producing mechanically a numerous variety in the struggle for existence. Some naturalists affirm that when individual species of fruit plants were brought into existence, individuals of genera widely diffused themselves, by the difference of localities, nourishment, and soil, formed varieties, and in consequence of their isolation having never been crossed and brought back to the main type, in the end became permanent and distinct species. A few declare the different species to be the specified productions of the formative tendencies of plants that arise from the various combinations of the fundamental forces of organic matter; others who have adopted the theory of development have only arrived at the conception that every species of a fruit plant is the gradually changed and transformed descendant of one or a few original prototypes.

It was difficult to unravel the mystery of the life of a fruit plant when there were no clear ideas regarding the constitution of bodies or the composition of chemical aggregates; but all species

are now claimed to be derived by descent with modification from one or a few germs that were originally vitalized by Creative Power; but by what agency their development has been produced has not yet been announced; all we know is that there has been a constant tendency to produce new varieties; and that the process of variation by which any great change in organic forms has been effected has been so slow as to be measured only by geological time. Variability, which is the rule among domesticated species, is the exception among the wild, but they become variable under the influences of change of habitat, climate, and food; and when these changes do take place, new varieties and species more suitable to the new conditions of life than the old, are formed by the conjoint action of self-adaptation and natural selection. Species, although not constant in their characters, are liable to great variations if accumulated through successive generations. Most varieties in a state of nature are local, so that while natural selection is forming a variety suited to the locality it preserves only the individuals adapted to that position, and destroys the rest. Within the limits of a short experience, every species produces its own kind; but variation may become indefinite in amount, if unlimited time is allowed for the variations to take place. The ways of Nature lead us to suppose that species, like individuals, were developed out of single germs whose parts gradually differentiated one from another. The transformation of matter being a nutritive or vegetable function, primarily is the decomposition by plants of water and carbonic acid, and the formation of organic compounds; then comes the arrangement of the latter so as to form tissues, which in the simplest construction are cellular; and this cell formation consists in the separation of the primary structureless germinal matter into consolidated substance which forms the outside of the cell, and the soft almost fluid matter which constitutes the cell contents. The organization of a fruit plant then may in part be accounted for by the direct action of external inorganic forces on the organism; by the organism itself producing self-adaptation, and by natural selection among spontaneous variations, which occurs only when a new individual comes into existence.

The supposition is quite warrantable that the first traces of fruit plant life existed in the form of protoplastic germs; that the soft gelatinous matter of the vegetable cell was the agent to which

has been assigned the duty of building up structure and of transforming the energy of lifeless matter into that of living. From the shapeless mass of protoplasm as a microscopic speck the varied processes of development are laid down in orderly sequence. The living plant passes through definite changes before it obtains the form and likeness of the parent, which variations mark its pathway from shapelessness to the characteristic form of its race. And this germinal matter exhibits changes of form and other movements which are not explained by any physical property or extraneous influences; the probable cause of the first formation of cells being, that various influences from without, on a minute mass of vitalized but inorganic matter, determine a slight hardening of the surface. The evolution and the development of fruit plants are really synonymous terms; their growth is simply a process of enlargement by which were evolved from a particle of matter called a germ, a substance potentially alive, having within itself the tendency to assume a definite living form. And this germ is not merely a body in which life is dormant or potential, but is simply a detached portion of the substance of a pre-existing living body. The process of evolution consists in a succession of changes of the form and functions of the germ, by which it passes from an extreme simplicity of visible structure to a greater or less degree of complexity; and this course of progressive differentiation is usually accompanied by growth effected by intussusception. This germ is only a nucleated cell — the vesicle contemplated as the fundamental form of organization — the meeting point between the inorganic and the organic, the end of the mineral and the beginning of the vegetable kingdom. The first step in the process of evolution is the division of the cell into two or more portions, which process is repeated until the organism from being unicellular becomes multicellular; the single becomes an aggregate cell, and to the growth and transformation of the cells produced from this aggregate do all the organs and tissues of the adult owe their origin.

Fruit plants may be regarded then as the modified descendants of pre-existing organisms, and not the unchanged posterity of similar forms of life originally specially created. The discovery of the indefinite remote ancestors of all plants, as represented by the monera, structureless infinitely small jelly-like beings, representatives of a kingdom intermediate between the animal and

vegetable, and the establishment of the plastic theory, has removed the idea that there was a primordial or spontaneous generation; and these simple little lumps of albuminous combination of carbon are to be regarded as the natural bodies which effect the transition from inorganic to organic nature.

It is quite probable that the fruit plants which we are familiar with were the lineal descendants of a class that lived before the Mesozoic epoch, and a practically unlimited time must be assumed for their development, and physical or geological science is unable to assign any special localities for their production on account of the changed condition of the earth's temperature. Of their character as food products we are ignorant; but it can be assumed that the immediate descendants of the first fruits were never absolutely like their parents, and that their remote posterity have differed considerably from them.

Since the distribution of fruit plant life has become a part of nature, such is the order and law of creation that the mutual relations of matter and motion, having been once established, have ever since remained in perfect harmony and system; and that kind of life under the special conditions of climate and circumstances is exhibited that is best adapted to exist. A fruit plant shows adaptation while it suffers modification; it originates, multiplies, and disappears. The favorable variation of any species of fruit is a slow process, relying on changes in the constitution of the plant as well as those of climate and other external causes. The continuance of its life depends on the development of those little bodies in the seed-vessel, which are fitted by certain processes to unfold into new plants, which under certain conditions are capable of giving origin to new races or varieties that live under the sway and control of outward forces. The life of every fruit plant in nature undergoes constant variation and change; the two factors always at work being a tendency to change and the influence of environments. Change is the law, variation proceeds if the causes are obscure, and nature encourages deviation by progressing from the general to the special attributes of the organism. The physiological function of nutrition affords a general explanation of variation, which is manifested in the action of water, the atmosphere, the influence of sunlight and temperature, of climate and soil; while adaptation is only the consequence of all those material variations produced in the change of substance

of the organism by the external conditions of existence or by the influences which surround them. The laws of adaptation, or the facts of variation caused by the influence of outward circumstances, are as important as the laws of inheritance. All phenomena of adaptation can be traced to states of nutrition of the organism, in the same way as those of inheritance are referable to conditions of reproduction, though both may be traced to chemical or physical causes; and these new forms of organisms, the transformations which artificial selection produces in the state of cultivation, and that which natural selection furnishes in the state of nature, arise solely by the interaction of these mechanical causes. The functions of inheritance and adaptation have been able so far to produce all the variety of fruit forms, but as to the causes of deviation, naturalists have assumed the interaction of a changing and a preserving formative tendency, corresponding with the processes of adaptation and inheritance. The latter strives to keep the organic form in its species, to form the descendants like the parents, and always to produce identical results; while adaptation, which counteracts inheritance, constantly strives to change the organic forms through the influence of the varying agencies of the outer world; to create modifications of those existing, and to entirely destroy the constancy and and permanency of species. As fruit plants were born with a tendency to vary, so many forms have been slowly evolved during the ages from those which were simpler and older; and could we trace back their history we should undoubtedly find evidence that in the past they had for a common ancestor species that had not acquired any of their distinctive features; the characteristics of the wild individual having been caused by its scanty food and constant exposure. The fact that variation is due to the action of changed or unnatural conditions upon certain cells of a preceding generation is a reason why wild fruits vary and have individual peculiarities, each plant being under slightly different relations to the external world from all the others; but as compared to domesticated species their conditions of life are very uniform. Domestic varieties vary more than their wild relations; and fruit plants long propagated and cultivated by seed are highly variable, owing to changed conditions of life. The tendency to vary is in itself hereditary; one variation is the cause of another variation; a change in one cell of an organism will disturb the harmonious adjustment of all related cells.

The combined action of the laws of heredity and variation have been the means then of bringing about the evolution of fruit plants; their characteristics are due to the influences to which they have been exposed, while their present forms exist through the survival of the fittest relations; they depend very much for existence on their environment, in which changes occur without any preparation for them and when very great result in the death of the plant. This consideration leads us to notice that many fruit plants subject to health and disease are dependent on many and complicated conditions which are beyond our control, while others are accessible and capable of being modified by our actions. A fruit tree is a chemical laboratory in constant action; its physical or chemical properties, diversely modified, underlie nutrition, growth and reproduction; and it is constituted of substances more or less fluid and solid which hold in solution salts and gases. Atoms of atmospheric origin constantly mingling with the organic molecules are separating them, and would destroy the tree if food had not been introduced from without into its texture; which renovating substances, after having undergone preparatory chemical changes and become nutriments, are assimilated by the trees. Complicated unions with other elements are formed by carbon, whence arise the first and most indispensable basis of all vital phenomena, the albuminous combinations.

There is something in the surrounding circumstances in which a fruit plant is placed that is the most probable stimulant of change of its character, because it is entirely dependent on terrestrial forces for its sustenance and preservation. The difficulty has been to connect these movements with change of structure; and all we can assume is, that those plants whose changed organization gave them an advantage over those not so favored, have survived and transmitted their modifications. Sometime we must expect to have a science of life that will tell us why some fruit plants have died out and others have survived; while now only the fact is established, that health, disease, and death sooner or later take place; after an allotted period the tree ceases to perform its proper functions; it remains primitive or unchanged; it progresses or retrogresses. Periods of growth, of bloom, and of decay will exist, which decadence is degeneration, not dissolution, when applied to species; while the cause of the transportation is not deterioration, but adaptation or modification by the aid of external formative forces.

Degeneracy in the organs of fruit plants implies then nothing pathologically or constitutionally injurious in character; but means only a step down from the genus, implying retrogressive or at least arrested conditions. From a structural or anatomical view, degeneracy is a loss of some elements without corresponding development of other parts. Evolution has thus been not only progressive but at times retrogressive; its doctrine asserts an endlessly irregular alternation of epochs of life with epochs of decay.

Since living Nature gravitates towards progression and improvement, it may justly be said that a fruit plant exists between the two great tendencies of retrogression and advancement. While progressive evolution develops the tree, extends the branch, clothes it with verdure, expands the blossom, and ripens the fruit, so degeneration lops the aged stems, prunes the weakly foliage, trims the budding growths. And this degeneracy will often depend upon external conditions of temperature, food, warmth, and moisture, and may frequently be called spontaneous deterioration when we do not know the cause of the phenomena; that is, a fruit plant may be advanced or degraded by the influence of the physical conditions in which it lives; for nature is always willing to go backward or forward as the result of the law of development. Each function of a fruit plant has its special limits of temperature, which does not exist independent of that of the exterior medium; and when an equilibrium has been maintained, the tree will grow; but organized vegetable bodies are perpetually mutable; their growth is only slackened when the tissues become mineralized. Each bud has its own existence, so long as it attracts and elaborates the nutritive fluids; and leaves often terminate their foliaceous growth, decay, and fall off before the appearance of autumnal cold. This change takes place only when an excess of mineral substances encumbers the vegetable tissues, and determines the death of the anatomical elements which they contain. Extremes of heat and cold affect many of our fruit trees and vines; their anatomical functions soon cease when subjected to a too elevated temperature; while cold, which retards the nutritive phenomena, will not always destroy but will merely suspend them, because the vital activities and qualities are directly derived from the physico-chemical properties in the midst of the anatomical elements. Thus it is that fruit plants grow stronger, languish, or hasten to final extinction, on account of the sway of

the molecular movements and mutations of which they are the expression.

Blossoms of fruit plants that are habitually self-fertilized sometimes indicate degeneration, as shown in the reduction in the size and number of the stamens and quantity of the pollen, the latter being sensitive to barren soil and inclement weather. A too energetic vegetative system will likewise surely affect the reproductive.

No new organic form can be directly produced, but organisms may be created under new conditions of life which are such as to influence and transform them. All of our fruits, originally descended from wild species, have been transformed by the peculiar conditions of culture. In their native habitat the same forms are produced year after year; but in the garden great changes are made by the gardener, who, skilled in the art of selection, is enabled arbitrarily to create entirely new conformations by propagating according to a plan under the influence of special conditions. He employs only the privileged beings for propagation, while natural selection without a plan acts more slowly to produce a particular kind of individuals. New species arising from natural selection will maintain themselves more permanently and will return less easily to the original form than the products of artificial selection, and will maintain themselves a longer time, although the nature of the transformation and the means by which it is produced are the same in both. Every species of domesticated fruit transmits to its descendants the peculiar individual qualities acquired during its existence as well as those which it inherited; and if they should become wild, would experience changes that seem to be adaptations to their new mode of life, and relapses into the ancient form out of which the cultivated had been developed. The longer a desired peculiarity of a new kind of fruit has been transmitted by inheritance, the more certainly will it be retained. Fruit plants in their wild state are subject to variation, and under the influences of their environments do assume certain new peculiarities in vital activity, composition, and form, which have not been inherited. Permanent variations are often produced by causes which develop diseases that are only dangerous adaptations of the organism to injurious conditions of life. Fruit plants in a cultivated state are quite liable to become sterile; there is no development of the

fructified germ, because a changed mode of nutrition has destroyed the capability of reproduction. Varieties of all species of fruit will deviate frequently in important peculiarities, as a consequence of different conditions of nutrition, air, and light. But there is a limit to the adaptability of every organism, for in aged fruit trees only the most necessary organs of nutrition and propagation retain their activity; the remainder have degenerated; a divergence in a retrograde direction has taken place, which is a relapse to simpler conditions of life.

Few wild fruits become extinct, and many are of sufficient value to be worthy of improvement by cultivation. In their native haunts their quality is improved by pure air, rich soil, and bright sunlight. But they often change their conditions. Wild strawberries will disappear in the meadows, but reappear again in after years. A piece of forest land burnt over and left uncleaned will frequently be occupied by red raspberries; after a short period by black-caps and later by blackberries; all of which disappear in time and give place to other plants. Adventive species are also sometimes found which have strayed from domestic care. They appear and vanish because they cannot long endure the conditions of climate, but a change in their habits is frequently brought about by artificial methods of propagation. There are no signs among Nature's laws that indicate a tendency to the dying out of our favorite fruits; neither do they fail from necessity or in accordance with irrevocable laws. To explain fruit deterioration we must not look to causes inherent in the variety, for when we speak of degeneration of fruits or a decline in their good qualities, we mean that certain varieties do not maintain their character for healthfulness, hardiness, and productiveness; and this lack of vitality may be due to enervating methods of growing, the mutations of seasons or climatic influences, incessant propagation from the same stock or perpetual growth upon the same spot, and to the mildews, rusts, rots, and other fungous elements which are of recent origin, all implying degeneration of culture but not of varieties. Fruits demand constant care and high cultivation to keep them up to the standard, and Nature permits no deterioration unless she is interfered with. We think we raise the standard, but it is an artificial one and must be maintained by artificial care, lacking which Nature goes back to her original criterion.

Fruit trees and vines degenerate when they do not produce fruit in as large a quantity or of as good a quality as when they were first introduced. An improved strawberry plant is only the result of a higher cultivation than it can receive in its native condition, and its tendency is to go back to its original state, which can only be prevented by keeping up the character of the plant to as high a standard as that from which it was originally produced; and it is surprising that so many plants, considering the treatment they receive, sustain their vitality so long as they do. The cultivated strawberry loses its original characteristics sooner than any fruit we are acquainted with—often without visible neglect. The blossoms are not always abundant fruit bearers; only a part of their number develop pistils sufficiently to swell into perfect fruit; and those plants that bear consummate flowers are only more or less fruitful as they produce stamens and pistils in sufficient or adequate proportion to one another. The pistillate flowers of the Hovey variety have degenerated into perfect flowering plants, so that the pistillate organs that remain do not make a respectable show of fruit. Raspberry and blackberry plantations deteriorate when the dead canes are not removed, and this deterioration is due to the absorption of moisture from the roots by lifeless wood. Wet land is always a cause of feeble growth and winter killing, and severe frosts are enervating to many fruit plants.

This weakness or tendency to disease, called degeneracy, pervades other fruits. The Early Harvest and Seeknofurther apples; Flemish Beauty, St. Michael, and Diel pears; Black Eagle and Black Tartarian cherries; Isabella and Catawba grapes in Rhode Island; Canfield and Vandevere apples in New Jersey, and the Spitzenberg apple in the Champlain Valley of Vermont, are only a few varieties of the many that are now grown with indifferent success. Cultivated fruits will grow their allotted time and supply us plentifully, as long as our plans conform to those conditions of soil and climate which are necessary to the health and vigor of the plant we desire to propagate, and no longer. The best fruits of today will be prolonged, but decline will inevitably come and newer varieties will take their places, to be supplanted in due time by others.

Many kinds of apples are less reliable in the West than formerly, which is attributed in some degree to forest destruction. Fungous diseases have increased; pear blight, apple scab, rot and

mildew, black knot, rust, and yellows, are alarmingly prevalent. The orange groves in the Azores; the olive trees of Southern Europe; the mulberry growths of China and Syria, have sustained great loss of vitality from an unusual development of black mildews on the foliage. During the past year thousands of acres of vineyards in Southern California have been destroyed by a new mysterious disease that is not produced by any insect. The habit of planting new trees in situations where the old have perished is a peculiarly dangerous one to young fruit plantations, arising from the spawn of fungi, which are often found deposited in the old hidden stumps and decayed roots. Composts of decayed leaves, twigs, and other vegetable material that strews the ground, will also harbor injurious matter which may prove to be a source of harm to a healthy growing plant. Insect enemies are now increasing and more frequently invade orchards and vineyards. The curculio, once only destructive to the plum, now marks the peach, cherry, and apricot, as well as the pear, quince, and apple. Increase in plant diseases is certainly an agent that causes fruits to decline, as witnessed in the downy and powdery mildew, black rot, and anthracnose which attacks the grape; the yellows and peach curl; the leaf fungus and black rot of the plum; apple and raspberry rust; apple and pear scab; and pear, gooseberry, and strawberry leaf blight. Fruit insect-pests are annually increasing, now numbering at least a thousand in this country; so that a general knowledge of the elements and applications of economic entomology seems to be desirable and almost necessary, to ward off these causes of decline in varieties. Much degeneracy is properly attributed to ignorance and want of skill and care in cultivating. Sound trees can only be produced from seedlings of first-class fruits: and the sooner a tree is transplanted after its top is formed, the more favorable are the prospects of a healthy growth and an unimpaired vitality.

The decline in numerous varieties of fruits shows how important is the attempt to produce new ones, and suggests the inquiry why so few kinds of recent origin are worthy of special commendation. New original varieties of fruit have a tendency to revert to an ancestral form. Certain kinds propagated by seed not crossed with another variety, sometimes degenerate on account of increased liability to disease and from the want of the rich stimulants they demand, but they do not run out or lose their distin-

guishing characteristics from any inherent cause. Neither do varieties propagated by buds and grafts necessarily deteriorate and die, although trees propagated only by buds have a weaker hold on life than a series produced from seed. The positive evidence of vigorous old trees bearing sound fruits, is an argument that aged varieties do not wear out except by exhaustion of the soil, incoming of disease, alteration of climate, or other natural circumstances, where failure is manifest. Non-sexually propagated varieties are not endowed with the same unlimited power of duration that is possessed by varieties and species propagated by seed. The inference to be derived from the principle that cross-fertilization between the individuals of a species is the plan of Nature is fairly sustained, that no bi-sexual species constantly self-fertilized would continue to exist. If such theories can be maintained, we must conclude that sexually propagated varieties or races, although liable to disappear through change, need not be expected to wear out and do not; but that non-sexually propagated kinds, though not especially liable to change, may theoretically wear out, yet but slowly. There is a tendency, inherent in species as in individuals, to die out, since no organic being self-fertilizes indefinitely. This is now counteracted by wider sexual breeding, amply secured in nature, which reinforces vitality to such an extent as to warrant the inference, "that some unknown great good is derived from the union of individuals that have kept distinct for generations."

The phenomena of the life of fruit plants and their structures thus have been formed and produced according to the laws of growth, reproduction, inheritance, and variability. The science of morphology informs us what their manner of organization is; physiology tells us how they live and the laws of their distribution where they are found; the science of causes how they have come to be what they are. But important problems remain unsolved and modern observers do not yet give an intelligible account of the changes which succeed one another during the growth of the smallest particle of the simplest fruits nor of the mode of origin of the first living matter that formed the plants. Nature only constructs, and scientific men must be allowed to work on in the investigation of the origin of new forms. Fruit evolution so far as now explained seems to take its stand on the rational interpretation of the facts of Nature; and there is grandeur in the contemplation of the wonderful and beautiful forms

that have been, and are being evolved from a simple beginning. Botany and geology are supplying the means by which the life of bygone days is revivified, enabling us to interpret the structure and relations of fruit plants long extinct. "We are living now as in a twilight of knowledge, charged with sublime revelations; so also are we looking for more light, which shall reveal perfect order." While the influence of cultivation alters the peculiar nature of fruit plants; so will they continue to exist and grow under favorable conditions of life; but when these are changed, they will languish and cease to be stable and profitable varieties.

At the conclusion of the lecture a vote of thanks was passed to Mr. Bourn for his paper.

Notice was given that on Saturday, January 19, F. L. Temple, of Somerville, would read a paper on "The Nurseries of Europe," many of which he visited last summer.

BUSINESS MEETING.

Saturday, January 19, 1889.

An adjourned meeting of the Society was holden at half-past eleven o'clock, the President, Henry P. Walcott, in the chair.

The President announced the following Committee to nominate delegates to the meeting of the American Pomological Society: William C. Strong, Frank W. Andrews, Stiles Frost, Robert Manning, and Benjamin G. Smith.

The Committee subsequently reported the following list of delegates:

President Henry P. Walcott,

Hon. Frederick Smyth,	David B. Flint,
William C. Strong,	Elijah H. Luke,
Charles H. B. Breck,	Edward Kendall,
William H. Spooner,	Jacob W. Manning,
Charles L. Flint,	Felker L. Temple,
Frank W. Andrews,	Horace Eaton,
O. B. Hadwen,	George W. Fowle,
Stiles Frost,	Benjamin P. Ware,
Chauncy Smith,	Francis H. Appleton,
Robert Manning,	Benjamin G. Smith.

The President stated that the Committee on Repairs and Alterations of the building felt somewhat embarrassed as to the course to pursue. The question whether or not the Society will make this building its future home had come up for decision, and the Society also recognized the fact that the building, in its present form, is not the best investment of its value. The Committee were unanimous in their judgment that an expression of opinion on these points should be asked from the Society. The Inspectors of Buildings had given a statement of the alterations which they thought necessary to prevent the spread of fire, and it was probable that these changes would cost as much as the loss by fire; that is, they would add nine thousand dollars to the cost of restoring the building.

William C. Strong moved that the next Saturday, the 26th of January, at ten o'clock, be assigned for the consideration of the subject mentioned by the President, and after some discussion the motion was carried. It was voted that the Secretary send a notice of the meeting to every member of the Society.

Adjourned to Saturday, January 26, 1889, at ten o'clock.

MEETING FOR DISCUSSION.

Notes on European Nurseries.

By F. L. Temple, Somerville.

To American visitors European nurseries are first of all an inspiration, as they are the old creative centres from which have come to us many of our best fruits and flowers.

We turn instinctively to them yet, for new and improved forms of plants. Nowhere else are there so many men living so close to the creative forces of nature as there.

European nurserymen — the best of them — are a distinct class of intense specialists, who have their whole hearts as well as their heads in their work, and we are told that "the heart giveth grace unto every art." They also have the advantage over us that the great plant collections of Europe are easily accessible to them, as at Kew and other places, where the geniuses of the hybridizing brush select the newly found species which are to be transformed and blended "into something new and strange." Inherited adapta-

tion also probably helps some of them, and the familiar handling of plants from early youth under their fathers' tuition.

These nurseries are also extremely interesting to Americans from their past achievements, whose benefits we have all shared, and this strikes us with new force when we come to see the places where, for instance, such things as the so-called Ghent Azaleas were first produced, or the Hybrid Rhododendrons, or the Tuberous Begonias, or many other things that we use and enjoy. Most of these nurseries have nothing in the way of location or landscape to make them attractive; the whole interest is centred in the plants grown there, or the great works of the past, by which some addition has been made to the world's riches or happiness. Such gardens are the real "gardens of Eden" to my mind, where plants are created and set round about; but the *men* who *do* these things are the part of the study that most engages one's mind in going over some famous nursery.

They are always genial and even a little enthusiatic with those of like tastes, but always keen-eyed eager students of plant life, and withal practical business men. And how very differently they go to work to get new plants.

One, like M. Transon of Orleans, France, will collect every kind of tree and plant that is hardy in France and of any commercial value, from all the world over, and plant them in such amazing quantities as to have covered three hundred acres with beds four feet wide, containing millions of young plants, from three inches to three feet high. All our own best native shrubs and trees stand there in incredible numbers, and are all sold while quite small at prices incredibly low. More than five thousand dollars are paid yearly for seeds by this house.

I had often wondered whether the young trees received from them at such ridiculously low prices, were grown without any care or cultivation to save expense. The truth is they receive the most painfully perfect cultivation.

Now among these multitudes of seedlings are detected, by the lynx-eyed gardeners, here and there, individuals differing more or less from the type. These are planted in test grounds and most of them thrown away later on as undesirable, while occasionally one will prove a valuable new variety that we should all covet. Then also in these immense numbers of trees many "sports" are noticed — yellow foliage or some abnormal growth on a single

branch. The same sorting and study of these is made and the same results follow—many poor ones to one good one. All weeping trees are first obtained by the process of selection from seedlings, and most variegated sorts by the same method — the sporting of a single branch — "bud variation" as it is called. But the truly creative florist is such a man as Lemoine, or John Laing, or Veitch, who looks at all the newly found botanical species of flowers that are brought together by that remarkable adjunct of European nurseries, the "plant collector," from the ends of the earth, and says — This species has beautiful foliage, and that one has gorgeous blossoms and poor foliage. Let us coax Mother Nature to combine especially for us florists, these two good habits in one plant. Now follows the most marvellous thing of modern days. This patient plantsman induces Nature to break down in this instance the very thing that gives all their values and all their stability to the trees and plants of the earth,— that is to say, their specific limitations!

After keeping these two plants for ages within their own rigidly defined habits and customs, the members of each species growing up as uniform as a Quaker congregation, at the importunity of a man who dares to ask it, she "makes the sun stand still on Gibeon" for him, gives a special license to unite these two members of two separated families, and the offspring of this union gives us a choice of many combinations of the two desired qualities. This comes the nearest to a miracle of anything in modern times. Sometimes, however, when the florist asks too much, she says, No! All these thoughts crowd upon us as we look, for instance, at the new tuberous begonias in flower at John Laing's, near London, and from the wonderful blossoms to the wonderful old man who has persuaded Nature to do these things for us. In a very few years — ten perhaps — some wild species of begonias have been induced to cross, and have been so assisted also by generous culture that I saw one single kind whose flower actually measured seven inches in diameter, and some smaller ones were as double as the best zinnias, with much of their shape, too. Mr. Laing's fine houses, which were very skilfully staged, were filled almost to the roof with plants of all sizes up to six feet high and three feet broad, all simply loaded down with a class of blossoms almost totally novel to my eyes, of all shades of orange, white, and red, and of such amazing size and figures as set the senses in a whirl of delight and doubt. Could these be really begonias? Outside in

the open ground were perhaps an eighth of an acre of a special class of these plants selected as most useful for bedding purposes. None of them grew over a foot high and all were full of mostly dark crimson flowers from two to four inches across. These should have a full and fair trial here, as the effect is very striking and beautiful. I begged this genial old man who has done so much, to turn his attention to the good old tall phloxes, which still need genius and patience and are capable of so much improvement.

Another place that was first in my thoughts as I left home, was Thomas S. Ware's, at Tottenham. If you would like to see nearly all the hardy herbaceous plants worth growing that are yet known, you could easily do so by staying at Ware's for a summer. Little crossing is done there, but all the fine things coming to light anywhere are at once added to his list. The fields of new Dahlias were the most gorgeous sight conceivable. Imagine two acres of the newest sorts, six plants of each in the very highest state of development, planted as a show ground merely for visitors. I value my notes made in that field, but cannot attempt any description of such blossoms.

Another class of plants here, of high interest and much usefulness, was the hardy Poppies. We consider the Parkman poppy the best one ever produced here, but I saw there several of far greater novelty and beauty. One was broadly striped with white on a vermilion ground.

The tall Phloxes were extraordinarily good at Ware's, and some new seedlings of his were great advances on the previously existing sorts. One, with very large salmon colored blossoms and large white eye, had a solid truss exactly the shape of a prize spike of hyacinth. This will probably be the parent of a section of phloxes with this new shape of panicle, which is very extraordinary. This was to me the most interesting single plant I saw in Europe.

The packing and the labelling at Ware's are as nearly perfect as I ever hope to do it. Zinc tags with the numbers stamped on them agreeing with the numbers and names in the invoice, bring every plant to the purchaser with the correct name. Mr. Ware also grows in pots one season those herbaceous plants which do not bear transplanting well. This causes them to give far better results when planted again here than they would otherwise do.

The famous nursery of Louis Van Houtte at Ghent, still shows the work of his master mind, although he has been at rest from his herculean labors for eight years. Large ranges of greenhouses are still filled with plants, and long frames and beds are full of hardy perennials, but the energetic mind that expanded a small business into an immense one world-wide in its influence, and which did so much scientific work of a literary sort in his beloved art, is no longer directing the business. Here were once grown great numbers of those bright hybrids of our own *Azalea calendulacea*—the so-called Ghent Azaleas—and they were sold at prices that brought them within the means of all. Only a few are now grown there, but they are still grown for the trade almost wholly in Holland, and at very low prices.

One thing at Van Houtte's struck me as very touching. The various foremen of the different departments, with whom I inspected the nursery, all spoke of their late employer in a tone of reverence as "The Master," which was evidently sincere and as if they still felt his powerful personality.

I saw at this place, also, several assortments of plants in full leaf, being packed to go to such far off places as New Zealand, Australia, and also to America. All the material used for packing was very clean and new, and the whole work showed very great experience and great manual dexterity. An eye to the appearance of the whole was always had and the number of bulky plants that would disappear into a given crate or box was wonderful to see. I learned that these packers had never done anything else in their lives but pack up plants, and some were greybeards. Surely we have much to learn in our American nurseries!

One fact is instructive in this connection. They expend far more money in Europe on packing than we do, and European patrons pay it willingly as the cheapest part of their bill. Some American buyers will not do so yet, but I fear we nurserymen have a duty to do in teaching our customers the value of better packing by *doing* better packing. I noticed everywhere that the common workmen in these nurseries get nearer to their work than ours do here. They are more painstaking and more exact in all the many details of nursing seeds and cuttings into healthy trees. They *get down on their knees* far more than our men do, and as their opportunities for switching off into some other business are not so numerous, as in this land of opportunities, they

continue for generations to be faithful, plodding, expert workmen, always to be depended upon and always bringing on stock of even and satisfactory grades.

The common employment of women and children to do the weeding and some other work was very distasteful to me. A row of them kneeling upon little knee cushions and picking out weeds with knife and fingers was a sight that spoke of intense competition and narrow lives. There is, I must confess, an all pervading air of drudgery and an almost total lack of any enthusiasm and hopefulness on the part of almost all the common people employed. This is replaced by a strong sense of the stern necessity of doing their work well in order to live. Few of them can ever hope to rise to anything like comfort or ease, and their lives are dominated by the necessity that drives men downward, and not, as is oftener true here, by the hope that leads us willingly. It is only the educated few, whose horizon is wider, who seem to see much rose-color in the future. And so they go on forever, the proprietor keen, receptive, and ready to do new things or buy new things, to keep in the front rank of the trade; the common workers, expert of hand and eye through long practice of one thing, but otherwise dull and unambitious.

Thoroughly well trained, as is everyone in the nursery, they do their mechanical work well as cogs on a wheel, and would be amazed and horrified to see in this land, men of no more knowledge or training than themselves owning and managing nurseries, with a large sign in front and a good patronage too, from people who never had the benefit of any better service.

Discussion.

The discussion of Mr. Temple's paper was opened by William C. Strong, who said that it was very interesting and certainly very suggestive, and, he was obliged to add, very depressing. The conditions of life in this country are so different from those in Europe that we could hardly hope to have here such establishments as had been described. Few nurseries here are handed down from father to son as in Europe. On the other hand is the question of labor, which had a depressing effect on Mr. Temple, as it does on every one who goes abroad. It is useless to expect to compete with such labor. Last fall our seaboard cities were absolutely flooded with the products of European nurseries, which

were sold by auction at exceedingly low prices. The market was glutted. This is not a healthy condition of things either for growers or purchasers, and the effect on nurserymen will be depressing. On the whole, the picture of long-continued excellence in cultivation is not encouraging unless we can have protection, and he was free to say that he believes in protection.

Jackson Dawson was astonished at Mr. Strong's remark, for he thought many things are grown here more cheaply than in Europe. He did not think that any nurseryman in Europe could compete with American nurserymen — grow fruit trees in Europe, pay freight and duty on them, and sell them at as low prices as many of our western nurserymen, who offer apple and peach trees one year from the bud at the rate of five dollars per hundred. It is true that many seedling stocks from France are sold at very low rates; but he had known of many European exporters who sent the stock referred to by Mr. Strong, who are heartily sick of the experiment, as the plants in many cases sold for less than enough to pay freight and duty. Mr. Dawson thought good packing pays. Many plants received from Europe are poorly packed; the great trouble there is that they are packed too wet, especially those from around London where the soil is clay and the plants are packed immediately in wet moss and not dried off properly before being packed. In many instances the whole case has decayed. The speaker had found that the lightest packing is best—that is, the plants, especially those of a succulent nature, should be dry, and the moss used in packing moist — not wet — and having the moss around the roots and air space around the tops.

Robert Farquhar said that Mr. Temple's paper carried him back to his early days, for the seed firm with which he was brought up had also a nursery of one hundred and sixty acres, and, as Mr. Temple had said, a permanent force at the very lowest rates. In the fall gardeners who were out of employment would seek for it in these great establishments, which formed harbors of refuge for such, and this skilled labor was secured at low rates. In such places seedling trees could be grown at very low prices. Such establishments undertake the planting of forests by contract. European nurseries are great in the line of plants used there, but it is a different class from those most in demand in this country. The time is coming when these things will be grown on as large a scale and with as good success here as in Europe.

M. B. Faxon said that the lesson which he drew from Mr. Temple's paper was that we should not attempt to grow ten thousand different things, but should select special objects and endeavor to attain perfection in their cultivation.

Mr. Temple said that the nursery stock which was sold at such wonderfully low rates was almost wholly grown from seed. If one orders grafted plants from Europe the prices will be found much greater than here. Grafted apple trees from five to six feet high are obtained from American nurserymen at about half the prices charged by European growers, and peach trees at from one-third to even one-fourth of European rates. But on the other hand seedling plants are sold there at one-tenth of American prices. In so great a disparity of prices in these a duty of twenty per cent would make no difference in the amount of importation. He hoped that no duty would be put on European tree stock. England, which is the most beautiful country in the world, has free trade, and yet plants bring the highest prices there. More money is paid for nursery stock there than in all the world beside. In answer to an inquiry as to the loss on imported plants Mr. Temple said he had already received a dozen packages this year, and that five dollars would cover all the losses. If one handled French seedlings more than one year, he thought the average loss should not exceed two per cent. These little seedlings are not stocky; they need to be planted carefully very early in the spring and the earth should be trodden down firmly around them. In reply to a question how large trees could be transplanted safely, Mr. Temple said that it depended on how carefully they are handled; which qualification applied to the removal of plants of all sizes. His judgment was that practically it is not profitable to transplant trees that are over two inches in diameter, and generally not over one inch. But he had once moved between thirty and forty trees ranging from ten to fifteen inches in diameter, and they did well. They were taken from a peaty soil and were like pot plants.

Mr. Strong said that we have quick ingenuity and great mechanical skill. We are experts in budding, root-grafting, and various other modes of propagating. The mild climate of the South and the rich soils of our Western States are considerations much in our favor. But still, with their cheap labor, European nurserymen can produce stock in many lines at prices with which we cannot

compete without protection. The government ought to protect this infant industry.

Mr. Dawson took a more cheerful view of the matter than the preceding speaker. While he knew there is great competition in the immense amount of seedlings annually sent to this country, besides the immense numbers of small shrubs or trees sold at auction in our seaboard cities, he believed that the well known pluck and energy of the Americans, added to their mental activity, would enable them, if they were ever roused up, to produce a better class of trees or shrubs, which would take better with the general public and give better satisfaction, than the imported stock, and with close attention, close application, and hard work in America, nurserymen would succeed, and through them the American public would be better served.

Mr. Temple again alluded to the foreign grown plants sold at auction in our seaboard cities, remarking that they were largely in no condition to be sold. They were mere beginnings of plants and therefore not such as could seriously affect the regular demand. He spoke of the barberries, like knitting needles, which would require years of culture to be of use. They could not meet his needs when he has to furnish plants to landscape gardeners. There is no trade in America that warrants the gathering and planting seeds of forest trees, to any great extent.

Mr. Dawson said that two bushels of barberries would produce a hundred thousand plants six inches high the first season; but one cannot raise a specimen plant of it under five or six years, neither can a specimen plant be grown from the small imported seedlings in much less time. He also thought that American seedling nurseries are a great want in this country to counteract the importation from Europe of plants which can be grown as easily here. Such men as Douglas, Meehan, and others, who have made a specialty of this business, can and do sell as cheap and as good plants as many of those in Europe.

A vote of thanks to Mr. Temple for his interesting paper was unanimously passed.

It was announced that on the next Saturday Professor James E. Humphrey, of the Massachusetts Agricultural Experiment Station, would read a paper upon "Mildews."

BUSINESS MEETING.

SATURDAY, January 26, 1889.

An adjourned meeting of the Society was holden at 10 o'clock, the President, HENRY P. WALCOTT, in the chair.

The meeting was notified, by a circular sent to every member of the Society, that the question what course to take in regard to the Society's building would be considered at this time.

Frank W. Andrews, from the Committee on Repairs and Alterations of the Building, read a letter from the Inspectors of Buildings, giving a statement of the requirements which would be made by the Inspectors as safeguards against the spread of fire.

Mr. Andrews also presented plans, which he had prepared on his own responsibility and expense, showing his views of changes desirable to be made in the building to produce a larger income to the Society, with estimates of the cost of the changes and the revenue to be derived therefrom.

Robert Farquhar moved that the Society retain this building for Society purposes. After full discussion this motion was laid on the table, by a vote of fifty-seven to twenty-three.

The President stated that two of the members of the Committee on the Building would be unable to serve, and that the Committee desired to be discharged.

On motion of James F. C. Hyde, it was voted that a new Committee on the Building, to consist of five members, be appointed by the Chair. The Chair appointed James F. C. Hyde, Nathaniel T. Kidder, Frank W. Andrews, John D. W. French, and Augustus Parker, as that Committee.

The whole subject of the disposition of the building was referred to this Committee, with instructions to report definite plans and information to enable the Society to decide what course to pursue.

On motion of Francis H. Appleton, it was voted that the Committee be authorized to expend a sum not exceeding $500 in the preparation of plans and printing.

It was voted that the Committee report in print and that a copy of the report be sent to every member of the Society, six days before the meeting at which it will be presented.

On motion of Warren W. Rawson, it was voted that the President be added to the Committee on the building.

William E. Endicott moved that the Society remain where it is. On motion of Mr. Rawson, this motion was laid on the table.

William C. Strong laid before the Society a petition to the State Legislature for an appropriation in support of the new Department of Vegetable Physiology, established by the State Agricultural Experiment Station, and it was voted that the President be authorized to sign the petition in behalf of the Society, and to appear before the Committee of the Legislature in support of it.

Benjamin G. Smith, Treasurer of the American Pomological Society, announced the arrangements made with the railroads for the delegates to the meeting of that Society.

Adjourned to Saturday, February 2, at half-past eleven o'clock.

MEETING FOR DISCUSSION.

Mildews.

By James Ellis Humphrey, Professor of Vegetable Physiology in the Massachusetts State Agricultural Experiment Station, at Amherst.

Professor Humphrey, in compliance with a request, prefaced his lecture with the following brief statement of the object of the new Department of Vegetable Physiology connected with the Station. Two lines of investigation are proposed: first, the study of diseases caused by parasitic plants, which include by far the larger part of the diseases attacking cultivated plants, and which must be studied before remedies can be suggested; and, second, the investigation of the relations and functions of the individual elements of plant food farther than such investigations have yet been carried. He then went on, as follows:

In speaking on the subject announced for this discussion, I propose to consider chiefly its theoretical, scientific side, touching but briefly on the practical questions of preventing and combatting the diseases produced by the organisms under consideration, and trusting to the general discussion which may follow to bring out that aspect of the subject more fully. The chief interest of the practical man—the horticulturist or farmer—is to learn how to stop, or, better still, how to prevent the ravages of the increasing number of parasitic organisms which attack the plants under his

care and often so sadly reduce their yield even where they do not utterly destroy them. And the greater part of the studies of these parasites which are carried on have this practical end in view. But it must be remembered, and this point cannot be emphasized too strongly, that direct experiments in prevention or cure, without a sound and thorough knowledge of the nature of the trouble, are merely leaps in the dark, with as little chance of success as the random treatment of a human disease whose etiology is not yet a matter of scientific knowledge. In other words, the theoretical must, as a rule, precede the practical and serve as its basis, if it is to be effective and truly practical. Furthermore, investigations of this character take time—almost unlimited time. Nature does not give up her secrets on demand but only as the reward of cool, quiet, patient application. It is only fair, then, to ask those who are at least *no more* anxious for results than we who are plodding away at these problems, and who have *less* at stake than we, to be also patient. The work is progressing slowly, but all the more surely, for the real workers as yet are few. Far better, however, that there should be still fewer and of the real sort, than any more of that sort who proclaim a "new discovery" for every month and make the name of "Scientist" a reproach.

But the practical men who furnish the moral support and, directly or indirectly, the money which gives to us modest and timid "scientific fellows" the equipments and opportunities we must have to produce results, are just waking to the importance and significance of the thorough scientific study of these pests whose inroads on their profits are yearly greater. They begin to realize that it is economy to spend thousands to secure the saving of tens and hundreds of thousands, and that even pure science may not be such a totally utopian thing, after all. And just here lies the real hope for the future. The investigator must feel that he has the financial and moral support of those in whose interest he is working, and to retain these he must produce substantial results. But to produce results which shall stand the test of practice requires sound and thorough training, and this will be demanded in an increasing degree as our knowledge increases and the relations of science and practice become more harmonious. Thus we may hope that by a process of progressive development, with the survival of the fittest only, sensational science will finally be unknown except from the records of the past.

In selecting a subject for this address, it has seemed to me better, and probably more profitable, to choose a quite restricted field which I can hope to cover in some detail, rather than to attempt to string together a few facts gathered in a necessarily very superficial survey of a larger one. This moderately detailed examination of a single small corner of the whole great field of plant diseases will also, I believe, give a truer idea of its extent and of the need of further exploration, than any general, outline sketch of the whole could do. The word "mildew" is used very loosely, to designate either of several appearances or effects due to widely different causes.

But as our knowledge of the various parasitic diseases of plants, and popular interest in them, have increased, botanists, yielding to the demand for vernacular equivalents for the technical names of the various groups under which the parasites are classed, have pretty generally adopted this word as the English name of one or two groups. If we accept the authority of the United States Department of Agriculture, we shall apply the term to two groups, botanically quite distinct, and shall distinguish the two by prefixing descriptive adjectives. The Reports of the Department speak of the *downy* mildews and the *powdery* mildews. The structure and effects of the organisms composing these two groups are very different, and it would be impossible to discuss them together. I shall, therefore, confine myself to that group to which the term *mildews* is by some restricted — the *downy* mildews. This group, known to botanists as the *Peronosporeæ*, is a rather small and very natural one, and the life history of its members is much more completely known and understood than is the case with most of the vegetable parasites. For this result we are indebted chiefly to the model researches of the great German master and pioneer in this work, De Bary, whose untimely death a year ago has left a conspicuous vacancy in the ranks of the workers.

The members of the *Peronosporeæ* may be regarded, for our purposes, as separable into two smaller groups, or genera, known by the names *Peronospora* and *Cystopus*. Those included in the latter genus differ in several important particulars from the members of the former, and are often denominated the *White Rusts*. They do not, then, concern us at present, and may be ignored. We thus restrict the term *mildew* to those parasites included in the genus *Peronospora*, which we may now proceed to discuss.

And just here, allow me a parenthesis. The accurate statement of scientific facts or conclusions requires the use of scientific language. The vocabulary of any science includes familiar words used in a technical sense, and specially coined words. For these technical terms science has no apologies to offer; their use is the inevitable condition of accurate thought or statement, and whoever would become intelligently familiar with scientific methods or conclusions must be prepared to accept and adopt them. They give to thought and statement a definiteness most attractive to the precise mind, if it is the dread of the slipshod thinker. The layman may justly ask that these terms be clearly and thoroughly explained when they are first used, but the botanist may as justly feel free to use them after they have been so explained. Their seeming difficulty is only in their unfamiliarity, which is soon overcome.

The word *plant* calls to the mind of the average hearer the idea of a living organism growing in the earth, in which it is held and from which it draws water by means of *roots*, and having a *stem* above ground, on which are borne *leaves*. But this idea is an incomplete one; because probably a half of all known plants do not answer to this description at all. Most of the so-called *higher* plants, it is true, are composed of these fundamental organs—root, stem, and leaf—each of which has its special functions, and they may be designated *Stem-Plants*. Contrasted with them however, is an immense number of so-called *lower* plants in which there is comparatively little differentiation into special organs, and therefore little division of labor. In these simpler plants, the whole plant-body is known as a thallus and they may be termed *Thallus-Plants*. Typical examples are the "rock weeds" and "sea mosses" of our coast. Again, greenness of color is commonly associated with the idea of a plant; but this too is not a constant character. It is true some parts of the typical plant contain a green pigment which gives them their color; and it is this substance, called leaf-green or *chlorophyll*, which gives to green plants their power of preparing the complex organic compounds which serve as their food-material, from inorganic constituents taken from the air and soil. But cases are familiar of stem-plants which are without chlorophyll. Such, for instance, are our common Indian Pipe and Dodder, which must live on food-material elaborated by other plants. It is however among the thallus-

plants that cases of the absence of chlorophyll become numerous, and there, indeed, they include a majority of the species. These simple plants, without distinction of root, stem, and leaf, and whose tissues contain no chlorophyll, are known collectively as *Fungi*. They vary greatly in size, structure, and development, but they agree in these two particulars. Whence comes the food-supply of these plants unable to provide their own?

The dodder, as is well known, twines about the stem of some green plant, and sends into its tissues absorbing organs, which abstract its nourishing juices for the support of the dodder. Here we have a typical example of the relations between the *parasite* which thrives at the expense of its *host*, which is greatly weakened or finally killed. The Indian pipe, on the other hand, probably draws its nourishment chiefly from the humus in which it grows, which is composed of decayed plant remains and contains much organic matter still directly available. This plant is a type of those called *saprophytic*. On the same basis of division the fungi fall into two classes—those which live at the expense of other living organisms, the *parasites*, and those which live on the remains of dead organisms, the *saprophytes*. The latter consequently cannot cause diseases, and may be passed over with the remark that the best known saprophytic fungi are the *toadstools*.

The attacks of a parasite on its host-plant cause a weakening of its vitality, often produce also an abnormal stimulation which results in the development of monstrous or distorted organs, and frequently, finally lead to its death. The parasitic fungi, then, are those which cause diseases of plants, and which have special economic interest; and among them are included the organisms which cause diseases variously known as rots, moulds and mildews, namely the members of the genus Peronospora, the *mildews* in the restricted sense in which I have used the word. The mildews are parasites chiefly of herbaceous plants, though they sometimes live on the herbaceous parts of woody plants, and appear to the naked eye as whitish, gray or brown, downy or felted growths on the under surfaces of leaves and sometimes on stems. Those parts of the plant which are most directly affected are usually of a yellow or brownish color, and this discoloration often appears before the fungus itself is evident, affording to the practised eye the first indication of the disease. As we trace the life history of the mildew, it will perhaps be an aid in presenting the subject, if we select a typical example and

follow its individual development. A good type for this purpose is one of the most troublesome members of the group — the mildew of the grape vine. The white dusty patches produced on the lower sides of the leaves and the corresponding discolorations of their upper sides, are only too familiar to every owner of grape vines. They appear most commonly in midsummer, and the discolorations usually give the first warning of the presence of the disease. If, at this time, a thin section be cut through the thickness of the leaf, the vegetative organs of the fungus will be found pushing their way among the more or less closely packed cells of which the leaf is composed.

This vegetative body or thallus of the fungus consists of fine, colorless, branched threads occupying the spaces between the cells and at intervals sending globular absorbing organs into the cell-interiors. By means of these absorbing organs the food-materials prepared in the cells of the leaf are appropriated by the fungus, to the direct injury of the grape vine. The growth of the fungus, thus bountifully supplied with food ready prepared, is naturally rapid and luxuriant.

The cells near the under surface of the leaf are quite loosely arranged, leaving considerable air spaces which communicate with the outer air through special openings, or breathing-pores. As the fungus develops, the ends of numerous threads emerge either singly or in tufts, through these pores, standing vertically to the under surface of the leaf. Toward their ends, these threads branch freely into a tree-like form, the tip of each branch being drawn to a point. At each tip now appears a swelling which enlarges till the whole structure has the aspect of a tiny tree, with a fruit at the end of each twig. When fully formed these bodies, which are pear-shaped, are readily detached and great numbers of them are carried away in tiny clouds of dust by light winds. Each of them is now an independent cell, consisting of a mass of living matter surrounded by a delicate membrane, and about the one-thousandth of an inch in length. It is natural to suppose that they serve to reproduce the fungus, and investigation justifies the supposition. They may be known by a term commonly applied to nearly all the reproductive bodies of those plants which do not produce flowers, namely, *spores*. The term is a very general one and includes structures of the greatest diversity, which, however, perform for their respective parent plants the same office which is

performed for the flowering plants by seeds, although no spore is the exact equivalent of a seed. The spores in question are known as the *summer spores* of the mildew. When they are sown in water at a warm temperature remarkable changes occur in a few hours. First, the living matter in a spore becomes divided into several masses, which escape through an opening in the membrane at one end of the spore. Each of these masses is furnished with two hair-like lashes, by whose vibration it is propelled rapidly through the water. From their remarkable activity, which recalls that of animals, these bodies are called *zoöspores*. After a short time their motion ceases, the threads disappear, and the mass germinates by producing a tube from its side. If this germination occurs on the surface of a grape leaf, the tube pushes through a breathing-pore or bores through the surface cells to the interior of the leaf, where it produces the characteristic absorbing organs of the fungus, and a new parasite is established. If the germination takes place elsewhere than on a grape leaf, the tube soon ceases to grow and then dies. If, on the other hand, one of the spores fails to find the moisture and warmth necessary to its further development it soon dies.

We may notice here two points of general application. The species of parasitic fungi are limited, as a rule, each to a single or to a few closely related species of higher plants as hosts, and are incapable of development on others. The closely restricted conditions of successful germination of the spores of a fungus, demand that to secure the perpetuation of the species a vast number of spores shall be produced, that the enormous waste may not be fatal. As the parasite becomes mature the leaf becomes drier and more shrunken, and the fungus begins to provide for tiding over the approaching season of conditions unfavorable for growth. This is accomplished by the formation of *winter spores*, in whose production a true sexuality is shown. They differ from the summer spores in having very thick walls and in germinating only after a period of rest, and are produced from the threads of the fungus within the leaf. The end of a fungus-thread swells up into a rounded body containing a large amount of living matter, which becomes aggregated into a dense globular mass. The end of another branch becomes irregularly swollen, though of a much smaller size, and is closely applied to the surface of the larger

swelling. A passage is now formed by which the living matter of the smaller branch passes over and fuses with that of the larger. After this act of impregnation the blended mass contained in the larger branch develops a thick dense wall about itself, and assumes the character of a mature *winter spore*. In this condition it can successfully survive extreme and long continued cold or drought, and can, on the recurrence of favorable conditions, germinate and infect fresh grape leaves. The fungus so produced soon develops summer spores, which may infest surrounding vines at a rapid rate, and in its turn form winter spores towards the end of the season.

This is the story of the grape vine mildew. Leaves which are attacked rapidly wither, lose their power of providing food material for the plant, and at length fall off. Thus deprived of its proper food supply, the plant is seriously weakened, and while it may produce new leaves these may in their turn be attacked. But even if they do not suffer, the suspension of normal activity for a considerable period during the growing season is a check from which the vine cannot wholly recover, and those which have been seriously infested are always less mature when growth ceases, and so less able to withstand the severity of the following winter. Besides this, the fruit stems, and even the berries themselves, may be attacked, and the crop thus greatly reduced or even practically destroyed. This fungus is a native of America and was introduced with American vines into European vineyards about 1877. There it has spread very rapidly and has proved far more fatal in its effects on many of the delicate European varieties than on our own species, which may, perhaps, be supposed to have become somewhat inured to its attacks by generations of exposure and selective survival.

Another of the mildews equally destructive with that of the vine, and so equally important in an economic point of view, is that which causes the so-called *rot* and *blight* of the potato plant. The threads of this fungus penetrate the stems, leaves, and tubers of the host, causing the rotting of the tubers and, in severe cases, the complete collapse and death of stems and leaves. A casual glance does not detect the disease until it is far developed, but careful examination during its early stages will show the usual discolorations of the leaves at the points where, on their under surfaces, are found the downy tufts of branching threads which

bear the summer spores. The manner in which these spores are borne differs slightly from that characteristic of the other mildews, but the difference is not important for our present purpose.

Wherever the fatal fungus threads penetrate, the invaded tissue dies, and under favorable conditions their progress throughout the plant is very rapid. A few days of warm and moist weather at the right time may suffice to convert an apparently flourishing field into a mass of fallen, decaying, blackened stalks. The summer spores not only infest the leaves of fresh plants, but their germinating tubes, produced in the soil, penetrate young tubers which lie near the surface. Old tubers are protected by the cork-layer constituting the so-called "skin." Unlike the mildew of the vine, that of the potato is not known to form winter spores, but is perpetuated by the vegetative threads which hibernate in the tubers and resume active growth upon the development of new stems from them. Where the tubers are stored in a warm place, considerable rotting may occur during the winter, from the growth of the fungus in them; and sound tubers may even become infected from the diseased ones.

Perhaps next of the mildews in economic importance may be mentioned that which attacks lettuce, especially under glass. This fungus also appears in white downy or felted masses on the under side of the leaf, which becomes first yellow and then dead and brown. It produces both summer and winter spores in essentially the same manner as does the grape mildew, but each summer spore produces a single tube directly, instead of several motile bodies each of which may subsequently produce a tube. With reference to the germination of the summer spores, therefore, the grape mildew and lettuce mildew may stand as types of two different modes. It is evident that those mildews whose spores produce several zoöspores from each, which can give rise to as many new plants, have, at least theoretically, an advantage over those whose spores can produce but one new plant each; for the number of possible new parasites from a given number of spores is about eight times larger in the former than in the latter case, since eight is commonly the number of zoöspores formed from the contents of a single summer spore.

The lettuce mildew is found also on several plants closely related to the lettuce, including thistles, chicory, and the wild lettuce. This may serve to call attention to the fact that some of our com-

monest weeds, are, so to speak, own cousins of valuable garden plants, and many cases might be cited where the same parasite attacks both. Another case within our present group is that of the cabbage mildew, which is not, however, very destructive to that crop, but attacks far more frequently and more fatally the shepherd's purse, peppergrass, and other weeds of the mustard family to which also the cabbage belongs. The life-history and effect on the host-plant of this mildew agree in general with those of others of the group, and further detail is unnecessary.

Another parasite of the group we are considering has caused extensive damage in the West, during the past few years, to Fox-tail grass and to Hungarian grass or Millet. The leaves and flower-spikes become distorted and of a dark gray color, and winter spores are formed very abundantly in the tissues. The summer spores, on the contrary, are more sparingly or less conspicuously developed than in most of the mildews, so that the characteristic felted appearance is not so noticeable.

Several other species of mildew-fungi attack cultivated plants in Europe and may be expected in this country. Of these the onion-rot or mildew has been observed in the United States, but has not to my knowledge become epidemic, at least in our own state. Others which, so far as I know, have not yet been found with us, are the mildews of spinach, of beets, of poppies, and of rose leaves, though there is no theoretical reason why they may not be introduced at any time.

We come now to the practical problem of combatting these diseases, and are in a position intelligently to attempt its solution. Against the species which produce winter spores in the leaves, an obvious precaution is to thoroughly collect, remove, and destroy all the fallen leaves which may contain these spores. In the case of the potato rot, whose threads winter over in the tubers, great care should be taken to plant only sound tubers. And here it may be remarked that slightly infected tubers often show almost no trace of their infection and would be regarded, on ordinary inspection, as sound. On the other hand, in a season unfavorable to the development of the parasite, badly infected tubers may fail to communicate the disease to the plants grown from them. But our chief object must be to prevent the development and dissemination of the summer spores; or, failing in that, to prevent their germination and penetration into the tissues of healthy plants.

We must remember first of all that warmth and moisture are essential to the germination of these spores. In cases, then, where these conditions can be controlled, as in culture under glass, anything like an epidemic of mildew need never be feared. And intelligent market gardeners no longer do fear the mildewing of lettuce in glass houses, because they have learned how to check it promptly. But in out-door culture these meteorological conditions are only to a very limited degree controllable. It is certain that the injury caused by mildews in a dry season is insignificant by comparison with the loss in a wet season, and it has been found in the case of the grape vine that leaves protected from dew are much more rarely attacked than those exposed. This result would be expected on theoretical grounds, since the spores cannot germinate on a dry leaf.

During the past few years numerous experiments have been made in Europe and America in applying to grape vines various substances which may act as *fungicides*, preventing the growth of the parasite without injury to the leaves of the vine. For details of the various preparations used and the results of their application, reference may be had to Bulletin No. 5 of the Botanical Division of the United States Department of Agriculture. It is sufficient to say here that a considerable degree of success has attended the use of some of the applications. The most generally useful preparation seems to be that known as the "Bordeaux mixture," which consists of sulphate of copper, quicklime, and water, in definite proportions. This is sprayed over the plants thoroughly and when it has dried there remains a compound adhering to the leaves which does them no harm, but is promptly fatal to fungus-spores falling on it. This mixture ought to be equally efficacious in the related diseases we have discussed.

A comparative study of the behavior of different varieties of grapes, potatoes, etc., toward their respective parasites is important. So far as such studies have been made, they indicate a much greater susceptibility or predisposition to disease on the part of some than of other varieties. In the case of potatoes, the thick-skinned, dark varieties resist the rot much more successfully than the light, thin-skinned ones, some of which seem to offer a peculiarly favorable soil for its development.

Finally, it is a cardinal principle in dealing with any disease, that a thoroughly healthy organism has the best possible chance of

remaining so. Just as a sound, vigorous, well-fed man will expose himself where any other, weakened in any respect, would contract disease at once, so a plant with well-developed organs of assimilation and supplied with an abundance of the crude material of food will often resist the attacks of parasites, or will have no trouble in providing sufficient food for itself and for them beside. In this lack of rational feeding, in respect to both quality and quantity, lies, I believe, the secret of much disease and susceptibility to disease in both animals and plants.

Discussion.

Benjamin P. Ware believed that if the germs of potato rot are retained in the tubers by their vegetative threads, they have power to develop only under favorable conditions, and might in time be destroyed did not such favorable conditions appear. He considered it hardly safe to say we do not have any, for he believed there would always be enough preserved to keep the fungus along. Under favorable conditions the disease would spread over a whole field in from thirty-six to forty-eight hours.

Professor Humphrey replied to remarks and questions: The spreading of potato rot ensues after the fungus has "struck." Many experiments have been tried to find a remedy that may be applied at planting time, but thus far without success. When there is infection of the tuber to any extent, there is usually discoloration, but it may be too slight to be readily perceived. For study with the microscope, the potato must be cut in thin slices, which destroys it for planting.

Winter spores of the lettuce mildew are not produced under glass. But the existence of summer spores may thus be prolonged. Dryness in the summer may destroy the spores. Undoubtedly spores may be produced in leaves that are thrown away. Winter spores may thus be developed. We cannot yet wholly clear up this matter.

William D. Philbrick said he had noticed that whitish spots appeared in muggy weather in August upon both sides of the leaves of violets growing out of doors. The spots were white at first, then grew darker, and the leaf dried up. He had found the disease most troublesome in the fall. Sometimes the violet plants are all killed out. If any survive until Christmas they will revive in the spring.

Rev. Calvin Terry said that he had been much interested and instructed by the lecture, and on his motion a vote of thanks was unanimously passed to Professor Humphrey, for this intelligent and scholarly exposition of a scientific subject that is but little understood by the people, although of vital interest to all.

The announcement for the next Saturday was a paper on the "Structure and Management of Greenhouses," by William D. Philbrick, editor of the "Massachusetts Ploughman."

BUSINESS MEETING.

Saturday, February 2, 1889.

An adjourned meeting of the Society was holden at half-past eleven o'clock, the President, Henry P. Walcott in the Chair.

The following named persons, having been recommended by the Executive Committee, were, on ballot, duly elected members of the Society:

Charles W. Stone, of Boston,
Hon. John J. Hayes, of Dorchester,
Hon. Charles Whittier, of Roxbury,
Mrs. Mary E. Loud, of Chelsea,
Frederick Law Olmstead, of Brookline,
Miss Susan C. Lougee, of Roxbury,
Hon. Moody Merrill, of Roxbury.

William C. Strong, Vice President of the American Pomological Society, stated the arrangements finally decided on with the railroads, for the delegates to the meeting of that Society.

Adjourned to Saturday, February 9, 1889.

MEETING FOR DISCUSSION.

The Structure and Management of Greenhouses.

By William D. Philbrick, Editor of the Massachusetts Ploughman.

I do not know that I have much information that is new to offer upon the subject before us, but will endeavor to explain briefly some points that have suggested themselves during fifteen or twenty years of experience in working glass structures.

The aspect of the greenhouse should be facing the south or southeast for such plants as love the light and heat of the sun, as most plants do. But to this rule there are some notable exceptions; the Camellia, the ferns, some orchids and begonias, and some trailing vines whose natural home is in shady places, will thrive better in a house facing east or west or even north; and for the cutting bench a northern aspect is to be desired.

The angle of inclination of the glass roof is a matter of some consequence and differs with the purpose for which the house is intended.

Where a low temperature is desired and when the plants do not require much height for their growth, as is the case with lettuce, radishes, violets, pansies, primulas, and the like, a house with a rather flat roof, having the beds quite near the glass is to be desired. Most of the lettuce houses built by the market gardeners have an inclination of about 10° or a rise of three feet in a rafter twelve feet long, and the beds are from eighteen inches to five feet from the glass. Such houses are usually devoted to growing cucumbers in spring and summer.

Where a higher temperature is required during severe winter weather, and where the plants require more room for their growth, as for instance winter cucumbers, carnations, roses, and the like, it is usual to give the glass a greater inclination — say from 20° to 25° or from four to five feet rise to twelve feet horizontal.

Where glass is used facing the north, as in the northerly side of the span roof or three-quarters span, so-called, the portion facing in a northerly direction is often made much steeper — say 35°. This arrangement is in order to prevent snow from lodging, and to avoid a high back wall.

I like to have a chance to work a cart alongside the greenhouse and have movable sashes on both sides for the purpose of throw-

ing earth and manure in or out and for passing plants in when planting. It is far more convenient than using the wheel or hand barrow.

The glass mostly used for greenhouses is ten by twelve inches, or ten by fourteen inches, although some houses are built with glass fourteen by sixteen inches, and even sixteen by twenty-four inches, where light is important and expense is a minor consideration. The glass should be of good quality, free from blisters and lenses, and not crooked, but flat and by all means double thick.

The muntins or sash bars if supported as they usually are by purlines every six or seven feet, are best made of two by one and a quarter inches cypress, rebated to receive the glass and grooved at the sides so as to catch the drip from the melting frost or leaking glass. The purlines of two by four inches cypress, are sometimes supported on posts made by driving into the ground pieces of one inch steam pipe, which are then cut off in line with a pipe cutter, and the purline is bored on the under side half-way through to receive the pipes. This kind of post casts little shadow, does not rust away quickly, and is sufficiently stiff.

Ample ventilation must be provided by frequent sashes hung with suitable fastenings; some near the top of the house, others near the ground on the south side; and for this purpose it is usual to have from eighteen inches to three feet of the glass perpendicular on the south side.

Where several greenhouses are to be built near each other they may all be heated by one boiler by steam, but I like to have them about twenty feet apart in order to work a cart between them, and to give more light and divide the risk of fire, and also to give room for clearing the snow from the glass.

The heating of large greenhouses, especially where several are to be used in one establishment, is done far more satisfactorily by steam than by any other method. Those who object to it are usually those who have not tried it. The advantages are having complete and perfect control of the temperature, and economy of labor and of fuel. The economy of fuel is most apparent in large establishments where a night fireman is employed. Mr. E. M. Wood, of Natick, informed me that he saved nearly one-third of his coal bill by using steam in place of hot water, and with far less labor and more perfect results; the saving in his case amounted to two hundred tons of coal per year. In small estab-

lishments where no night fireman is employed and where consequently the coal must be burned slowly with a dull draft, leaving the fire to itself for several hours, there is little saving of coal by using steam; still the temperature can be more easily regulated than with hot water, and the cost of fitting up for steam is less than for hot water, since only about half as much pipe is required.

The best arrangement of pipes for steam heating is to have one flow pipe for each house passing overhead and branching at the farther end into as many return pipes as are required. Each of these return pipes is provided with valves at both ends and a small vent cock near the lower end to blow off air. By this plan the steam may be turned on to as many return pipes as are required to keep up the temperature. One and a half inch pipe answers for the flow, and one and a quarter inch or one inch for the return.

There is not the least trouble in maintaining circulation of steam in all the pipes, provided the boiler is powerful enough to keep up a pressure of two pounds to the inch, and provided that the condensed water in the pipes drains back freely into the boiler; and for this purpose the steam pipes are best arranged at a height of two or three feet above the water line in the boiler if possible. Of course the friction of the steam in passing through a long range of pipes, together with the rapid condensation as it passes along, tends to reduce the pressure, so that in a circuit of five hundred feet of pipe I have noticed a difference in pressure between the flow and return pipe near the boiler of from one to two pounds. This would be balanced by from two to four feet perpendicular height of water in the return pipe, and if there is not so much difference of height between the return pipe and the water level in the boiler, water will stand in the pipe, preventing circulation and causing "hammering" when the steam reaches it. There are cases, however, where steam pipes must be used at a lower level than the boiler, and then it becomes necessary to drain them and return the water to the boiler by a trap or pump. These are somewhat expensive and it is better to set the boiler low enough to avoid the need of them. Where no watchman is employed it is very necessary to use a boiler large enough to hold steam for several hours without attention. This is easily done by means of the automatic draft regulator, but the dull draft required by this method is wasteful of coal though economical of care;

about one-third of the coal is wasted in a dull fire, and if this waste is enough to pay a night man and something more then it will pay to hire him. This is not generally understood, it being a common mistake to think that a dull fire is economical of coal, while the reverse is true. In large establishments there is another advantage in having a good watchman. Our climate is extremely treacherous and it is not easy to leave the greenhouse for six hours so that it shall carry the uniform temperature required by delicate plants when the outside temperature may change twenty degrees without warning, so that where perfect work is to be done the steam boiler and night watchman are essential and economical.

The number of steam pipes required to maintain a temperature of 40° in severe weather is found by allowing one inch in diameter of pipes for each three feet of width of the house measured on the rafters. Thus a house whose rafters measure twenty-four feet will require pipes whose aggregate diameter is eight inches to keep a temperature of forty degrees. To maintain a temperature of 50° will require about twice as much pipe as 40°, and 60° about three times as much. Of course exposure to the wind will have much to do with the ease of heating a house; in exposed situations nearly double the pipe is needed. Where hot water circulation, *not* under pressure, is used, it will require about double the pipe to do the work that is needed for steam or water under pressure.

Watering under glass in winter is best done in the morning of a clear day, so that the leaves may dry off by airing the house. In spring or summer the afternoon is a better time, since the water then soaks in better. Water for tender tropical plants, such as cucumbers, should be of about the same temperature as the house and may be conveniently heated by a coil of pipe in the chimney.

Shading greenhouses is necessary in spring and summer, and for this purpose a mixture of glue and whiting, or of white lead and naptha is good. Lime injures the glass and putty.

The internal arrangement of the greenhouse must depend upon the purpose for which it is to be used. If for economy and profit, the beds are built of hemlock or cypress boards held in place by steam pipe driven into the ground. Beds raised from the ground are built of slates on a frame of cypress. It is well to keep the beds as near the glass as you can so as to get all the light possible.

In ornamental houses the work is done in stone and concrete and with as little regularity and stiffness as possible; a good example of this sort is to be seen at the conservatory of the Newton Cemetery.

I have thus attempted to briefly describe some of the important points in the structure of our greenhouses, those wonderful buildings in which the arctic blizzard is separated from the tropical climate within by only a film of glass one-eighth of an inch in thickness and where we grow the choicest productions of the tropics amid the snow and ice of our truly arctic winter.

Discussion.

F. L. Temple said that he has a house one hundred feet long by twenty wide, standing by itself, in which he has a small steam boiler with an automatic draft regulator. He agreed with the essayist that the economy of a watchman comes in in large establishments. The great advantage of steam is the ease and quickness with which heat can be added or lessened; steam pipes will cool in twenty minutes. To keep up a night temperature of 40° for hardy plants in such a house would require from six to ten tons of coal, according to the situation and the care with which the fires were managed. To keep it up to 60° would require twice as much coal. He has a house two hundred feet by twenty-four, in which he formerly used hot water, but for the last three years has used steam. To keep this up to 40° in severe weather with hot water took sixteen tons of coal; with steam about twenty tons.

It has been objected to steam that the water must be heated to 212° before heat can be diffused, but there is only a little water to heat, so that heat can be got up much more quickly than with hot water apparatus. Some of his neighbors use hot water under pressure, but he could not account for all the advantages claimed for this method. It does not require so much pipe as where only the pressure of gravity is relied on for circulation. Leakage is more troublesome from water pipes than from steam pipes. When it is desired to keep both ends of a house at the same temperature it can be done better with steam than with hot water.

William C. Strong said that the hot-water boilers heretofore constructed had been imperfect, but he thought that a perfectly constructed hot-water boiler would afford as equable heat as steam. He had used a Gurney boiler with great satisfaction; the

circulation was perfect, and it was managed with the greatest ease. This was in a small house; he thought hot water better for small houses, but steam for large establishments. He would not use glass less than twelve inches by sixteen, and perhaps would use larger, though the larger costs higher in proportion than the smaller.

Caleb Bates said he had just come from a store, twenty-three by forty-three feet in area, which was heated by a small lamp-stove having two burners. It was perfectly odorless, and he thought a small greenhouse could be heated well and economically also, by that method.

Mr. Philbrick said that if lamps were used, means should be provided for the escape of the gas produced by combustion.

Mr. Temple said that he had tried lamps, and they smoked if too low or too high, and had a good deal of odor. Dingee & Conard, the great Pennsylvania rose growers, have sixty-four houses which are all heated by flues, and always have been so heated, and they have had the greatest success in growing roses. If he were going to build a small house, say fifty feet long, for a general collection of plants, he would heat it with flues. The advantage is that they afford a variety of temperature.

Mr. Philbrick said that the objection to flues is their getting leaky and allowing coal gas to escape, which is injurious to plants, and they are not economical. Dingee & Conard's more than sixty fires must require a great deal of work. Flues can be used to better advantage with wood or bituminous coal than with anthracite. It is difficult to grow tropical and hardy plants together; where the collection is large enough they should be divided and planted in separate houses. Hardy plants cannot be grown in a high temperature. Violets require 40° at night, carnations from 55° to 60°, and tea roses from 60° to 65°, and by day 20° higher, giving air when necessary. Any plant will bear more heat in sunshine than in cloudy weather or at night.

Mr. Bates spoke of the late John Washburn, of Plymouth, who was very successful in resuscitating valuable plants which had been injured by injudicious culture. He would allow them to get wilted in the hot sun, then water them profusely, and later he would expose them to an almost freezing temperature. Mr. Washburn claimed that such treatment was "the way of Nature."

William E. Endicott was glad to hear the remarks which had

been made implying that flues are not without merit. In large establishments, where only one kind of plant is cultivated in a house, an even temperature is wanted, and in such a house flues are unsuitable. The first house that he built was sixty feet long and was heated by a flue, and the results were very satisfactory. He grew at the cool end anemones and similar plants. He would heat a long and narrow house with a flue now.

Mr. Strong thought the flue system antiquated, and did not see why we cannot get all the advantages of it with hot water. By the latter method the heat can be concentrated where it is wanted, and he thought it could be distributed more advantageously.

Benjamin G. Smith said that he has an octagonal conservatory, fifteen feet in diameter, attached to his dwelling-house, which he has heated with a Wethered boiler and two-inch wrought-iron pipes in a satisfactory manner.

Mr. Temple said that with a small house and a variety of plants one must have some means of producing different temperatures. If hot water can be arranged to produce this it will do, but flues are much cheaper. If carefully built they will not leak. He would build the first fifteen feet of brick, laid very carefully, and beyond that of glazed drain pipe put together with cement.

It was announced that on the next Saturday, J. B. Harrison, Secretary of the American Forestry Association, Franklin Falls, N. H., would speak on "Forestry as applied to Massachusetts."

BUSINESS MEETING.

SATURDAY, February 9, 1889.

An adjourned meeting of the Society was holden at half-past eleven o'clock, the President, Henry P. Walcott, in the Chair.

George W. Fowle presented his report as Treasurer for the year 1888, which was read by the Secretary, accepted, and referred to the Committee on Publication.

John D. W. French presented the following vote:

Voted, That a special committee of five be appointed by the Chair, to consider the subject of National and State Forestry;

the need of further legislation to protect the forests on our national domain, and the best means to promote a greater interest in arboriculture. The motion was unanimously carried, and the Chair appointed as the Committee therein provided for, Professor Charles S. Sargent, Professor John Robinson, John D. W. French, Francis H. Appleton, and Leverett M. Chase.

Adjourned to Saturday, February 16, 1889, at ten o'clock.

MEETING FOR DISCUSSION.

Subjects for Attention Connected with Forestry and Arboriculture in Massachusetts and New England.

By J. B. Harrison, Franklin Falls, N. H., Secretary of the American Forestry Congress.

New England has in her own territory a conspicuous illustration of the value of an extensive tract of mountain forest, and of the evils which result from the destruction of the woods. The White Mountain region of New Hampshire was, in its natural condition, remarkable for the *amount* of beautiful scenery in a limited area — that is, for the number, interest, and variety of its separate complete landscapes. Each picture or scene was large enough to make the impression of individual and satisfying beauty, and there was little waste space between them — merely for each one a natural and charming frame.

I have time today to mention but one of the functions of such a mountain forest — that of a place for summer rest and recreation; for sylvan peace and shade, coolness, beauty, and refreshing change for men and women weary of the heat and dust, the noise and wearing care of life at home and in the towns. The preservation of these mountain woods for this use was of vital importance to the people of the nation in general, and the inhabitants of New Hampshire possessed in them a source of perpetual revenues. As population, wealth, leisure, and the disposition to seek change of scene in summer increase in our country, these mountains and valleys would have been thronged by an ever-changing multitude of guests, glad to have the opportunity of paying liberally for the comforts and luxuries of life while sojourning at the great mountain hotels. The region was worth more to the people of the State than the richest gold mines would have made it. The one condi-

tion of a permanent and most liberal income was the protection and preservation of the forests. These have been cut and burned away in portions of the region in most unintelligent disregard of their value as a permanent possession. In consequence, much of the charm of the region has been destroyed, the value of the hotel property is being seriously threatened, and some of the places which were once among the loveliest are now desolate and hideous. This forest region might have been preserved uninjured forever, and yet it might have yielded another great revenue from the timber which it produces, most of which could have been cut at proper times without impairing the value of the forests in any way. All this would have been practicable if we had been sufficiently civilized.

I have not time to speak of the loss by the destruction of this great source of timber supply, nor of the injury to the streams which have their sources here, the disastrous floods and the depleted summer flow, or the effect on the industries and subsistence of thousands of men and women in the great mill towns between these mountains and the sea. The injury to New Hampshire agriculture is to be recognized, though it is less important because most of the State is unsuited to cultivation and should have been left permanently under forest conditions. Some portions of the hill country of Western Massachusetts have in a considerable degree the same character as the mountain region of New Hampshire, and should be taken care of accordingly.

The care of small tracts of woodland is of interest to many land-owners who think little about forestry in its larger aspects. It is common for men from the towns to buy places in the country, and then to find, when they begin to improve their wood-lots, that the trees begin to die and to blow down, being pulled up by the roots. This is very surprising to the owners; but they usually begin by cutting away all the underbrush, thus removing the natural mulch from the larger trees. If there are wet places they drain them, and, in short, they change as completely as possible all the conditions under which the trees have lived hitherto, and then they wonder that the trees do not thrive. One thing necessary to most trees in this part of the country is shade. In my own State of New Hampshire, as in many other regions, the southern sides of ravines and the north sides of hills grow up to trees when they are protected from cattle and fire. But where the ground slopes

to the south it remains bare. The trees will not grow, the young plants being scorched to death by the sun, and this is true of some of the level country where the land has been exhausted by tillage. Of course the forest would "skirmish around" and would cover such places in time, conquering them slowly from the edges. But such object lessons are instructive, if we have eyes to see them. The chief things required for the successful management of small tracts of woodland are to protect them from fire and from pasturage, and then to let them mostly alone. The trees will do best under the conditions which have produced them and have always nourished them hitherto.

The destruction of the timber of a forest by fire is a trivial loss compared with the permanent injury to the soil itself which always results from forest fires. The burned land produces only inferior trees, and repeated burnings destroy the soil itself. We already have deserts of our own in this country created by this process where the soil was once remarkably fertile.

But taking our whole country together, pasturage is a worse enemy to the forests than even fire, because it operates everywhere. It works more slowly but the final result is the extinction of the forest. If trees are to be grown and woodlands maintained in New England, it is necessary that some land should be set aside for forest uses and protected entirely from pasturage. The pasturage of woodlands is a feature of existing agricultural methods in which a change might well begin which should be extended to the whole matter of pasturage and its relations to the fertility of the soil and to the profit and loss of farming. There can be no considerable advance or improvement except by giving up some existing practices and methods and adopting better ones in their stead. A little synthetic observation would convince thoughtful men that pasturage has too large a place in our present methods of agriculture and that it is a wasteful and costly process, especially in its effects on the fertility of the soil. I think it would be an important step in a real advance in civilization if in Massachusetts and New England the pasturage of domestic animals were to a great extent gradually — and not too gradually — relinquished.

Forestry and arboriculture are chiefly economical subjects. Where tillage is more profitable than the production of timber or trees the land should be cultivated; where wood products are more profitable forest conditions should, of course, be maintained.

But considerable intelligence, instruction, observation, and forethought may be required to determine what lands are really available for profitable agriculture. A great deal of land is farmed in New England which should never have been cleared or cultivated. When farms are abandoned it means that they should never have been there. The land would have been more valuable under permanent forest conditions.

Our agricultural methods are steadily impairing the fertility and productiveness of a large proportion of the soil of our country. It is tilled and pastured to the last degree of exhaustion. A little while ago I saw the great wheat country of the Red River of the North ablaze with burning straw over hundreds of square miles. We are not worth so much as we think. Much of our agriculture impairs and exhausts the capital invested in land. Methods of life which exhaust the soil of a country cannot rightly be called civilized methods.

The wants of our people are increasing. More and more is required to make life comfortable, interesting, and satisfactory for the inhabitants of this country, while we deal more ignorantly and carelessly with the soil which is the storehouse from which nearly all our wealth must come.

I think that in New England forestry and arboriculture should be considered largely in their relations to agriculture and to the permanent fertility and productiveness of the soil. It is important to observe that while no method or system can reasonably be recommended which would be permanently unprofitable, yet much of experiment is necessary in forestry and arboriculture as in other fields, and we cannot expect that each particular step or effort will in itself be profitable or yield a good return for the capital invested. No considerable advance is easily or quickly made, and changes of methods are necessarily attended with some inconvenience. There is no way of learning all about these subjects at once. The great need is, not that people should accept any particular opinions or judgments regarding subjects about which there is room for difference and uncertainty, but that they should examine these subjects connected with forestry and tree culture with a new degree of attention and interest, especially in their economic aspects and relations. We do not need a sentimental fashion of talk about them, but we do need, as a means to an important end, to have the people of our country think, talk,

read, and write about these subjects until there is a *tree-feeling* in the air and a reverberation of sensible and practical teaching on the subject which will compel general attention. You are to be congratulated on the establishment last year of the new journal devoted to these and kindred topics and edited here in your own city. If some rich man would place "Garden and Forest" in every public library and reading-room in America he would do more good than if he should found a new university.

As Massachusetts usually leads in every essential advance in civilization, she ought to lead in the work of providing for the defence of the forests on the nation's lands, especially in the mountain forest regions of the Pacific and Central States. This valuable national property is in imminent danger of speedy extinction.

Discussion.

In the discussion which followed the reading of Mr. Harrison's paper, he was asked what is the best practical method of managing forest land, and replied that the two great things are protection against fire and against pasturage. In tracts bearing trees of considerable size care should be exercised in cutting out trees as soon as they come to maturity; after that time every tree deteriorates. We have much to learn in the way of judicious and intelligent letting alone. Some do not like to do this, but woods resent interference. There is a delicate adjustment of all the conditions which have brought trees to their present growth, and many people want to interfere with these conditions. Trees might as well be girdled as to have animals pastured among them. The underbrush should be allowed to grow. When trees *must* be pruned, the wounds should be covered to protect them from the weather; otherwise decay will begin and increase until it extends to the whole tree. The speaker saw a very large tree in Salem, N. J., from which large limbs had been pruned, and fungous growths were penetrating even to the green wood.

When woods have been cut off and a second growth begins to to sprout up, the weaker sprouts should be removed. It will require an intelligent man to do this properly, but it will pay.

Benjamin P. Ware said that the essayist had emphasized the importance of keeping cattle out of woodlands, but there is no grass to tempt them there.

Mr. Harrison replied that through the country people do not think it important to keep cattle out of their woodlands. In New Hampshire they are turned out early and eat off the young sprouts. In the spring cattle are greedy for something green. In a small tract of woodland the trampling of cattle will destroy trees, though he could not say why. Many people do keep stock out of woodland, but in New York and other States people have woods pastures.

William D. Philbrick said that in this neighborhood we have pastures and forests separate. After twenty-five years or more the trees are generally cut off clean, excepting such ones as it is thought best to reserve for seed.

Mr. Harrison said that sometimes it is best to cut off clean, and sometimes it may be best to cut trees as they individually come to maturity. Sometimes the new growth will start with greater vigor if the trees are cut off before arriving at full maturity.

William C. Strong asked if it would not be better to plant seedlings rather than to rely on sprouts to renew the forest?

Mr. Harrison replied that Nature's way is likely to be the best, but there are always some seedlings among sprouts. He did not see how it would be profitable to destroy a promising crop of sprouts, but a poor tree should be taken out as soon as its worthlessness is seen.

Leverett M. Chase asked whether, when one species of wood is cut off, a different one does not usually follow? Nature seems to have planted the seed.

O. B. Hadwen said that when oaks are cut off they are followed by softer wood, and pine is followed by oak, walnut, and other deciduous trees. The ground in pine forests offers the best opportunity for squirrels to plant acorns and walnuts and affords shelter to maple seeds.

There is now more forest land in Massachusetts than there was fifty years ago, notwithstanding the famous prediction put forth when the Boston and Worcester Railroad was in course of construction, to this effect: "In less than ten years after that railroad is completed there will not be a stick of wood left along the whole line; it will all have been used by the locomotive engines." A great deal of land has been brought under the plough that never should have been tilled. Steep rocks and inaccessible lands were intended by Nature for forest, and in

twenty-five years much of such land will return to wood. He begins to believe that the care of forests can be made a profitable pursuit. To raise clear timber is going to require the care of an educated man. He will ascertain that he can grow a white pine in good soil in one-fifth of the time ordinarily required, and by proper pruning he can produce clear lumber. Pruning pine trees is done on different principles from those applied to deciduous trees; the small limbs should be cut off a foot from the trunk, and in a year the remaining portion will be dead. Clear timber will command a much higher price in the future than it does now, and the speaker predicted that we shall have a supply.

Deciduous trees gain if the ground is enriched around them; he has elms planted in good ground thirty-six years ago that are now nine feet in circumference. Pines planted in 1846 are now suitable for mill logs. Larch makes good timber for inside work; he had trees of thirty years' growth which furnished timber eight inches by ten and about thirty feet long; some of it increased an inch and a half in diameter in one season.

Mr. Chase said that he had seen the evils of deforesting land, and to remedy it we must attend to two points — first, education, and second, legislation; the latter cannot amount to much without the former. Some men never look at a tree without thinking how many feet of lumber, or how many cords of firewood can be got out of it. Some of the grand old trees planted by the Pilgrims are now left to the worst part of our population, while the descendants of the Pilgrims flock to six-story buildings in cities. Last year two rare trees were cut down in Roxbury, which were planted by the late Samuel Walker, one of the presidents of this Society — a cedar of Lebanon and a fine specimen of the deciduous cypress of the Southern States.

In Nova Scotia the speaker had seen acres of forest burnt over for the sake of the blueberries which came in two or three years afterwards, and the same devastation for the same purpose north of Calais, Me. At Mount Shasta in California he saw where trees hundreds and thousands of years old, had been burnt by hunters. At a redwood lumbering camp he saw a tree fifteen feet in diameter and two hundred and fifty feet high cut down. All the marketable wood was saved and the light portions were burned. He suggested forming roadways three rods in width through forests to prevent the spread of fire. The cutting off of

forests is lessening the quantity of water in our streams. There is a brook in Haverhill where he used to catch trout when a boy, but four or five years ago he tried and found the water so low that he could not get any fish. Some of the wandering fishes, like the shad and salmon, want cold water, and this can only be had where streams are shaded by trees. He had seen ice in August under the moss in an Adirondack forest.

Cattle rarely, if ever, touch evergreen trees, and will not injure large, well-established trees, though they might do injury to young trees. In England cattle and trees thrive together. Seedlings will spring up six inches apart and should be thinned, and when large enough should have the lower limbs cut off. He hoped the time would soon come when children in schools would universally be educated to see the beauty of trees and to love and revere them and assist in preventing the wanton destruction of trees on which so much depends. Years ago Bryant expressed the sad thoughts of an exiled Indian upon revisiting the home of his childhood:

"Before these fields were shorn and tilled,
Full to the brim our rivers flowed;
The melody of waters filled
The fresh and boundless wood;
And torrents dashed and rivulets played,
And fountains spouted in the shade.

Those grateful sounds are heard no more,
The springs are silent in the sun;
The rivers by the blackened shore
With lessening current run;
The realm our tribes are crushed to get,
May be a barren desert yet."

Unless we are wise this prophecy is certain to come true.

J. D. W. French said that he is particularly interested in forestry, and had practised arboriculture with such success that he had received a premium from the Massachusetts Society for Promoting Agriculture, for a plantation of larch trees and another for ash trees. Mr. French added that possibly it might be wise for the Society to have a standing committee on forestry. He thought the Society should take a decided stand in regard to education and legislation; the latter not only of the State, but of the nation. We should first consider whether we have too few or

too many laws, and then look to the national forests which are daily becoming less and less. There is a bill now in the Senate on the care of the national domain, so far as forests are concerned, and though it might not be practicable to pass it during the present Congress, the committee would have all the more time to work.

Rev. A. B. Muzzey said that the subject before the Society is very important and of very wide interest. The indifference to it in Congress arises from want of intelligence. He wanted to see it made a matter of education. If we begin with the children we shall do one of the grandest works; whenever he walks out with his grandson he tries to teach him to be interested in trees. We want our farmers every one to be interested in this matter. He was in favor of having the subject brought into the schools; every boy should be interested in the culture of trees for his own sake as among the grandest and noblest productions of Nature. The subject is legitimately within the scope of this Society, but he would like to have a society for the protection of trees.

F. L. Temple said that the best place to start the crusade in behalf of trees is in the text-books of the common schools. No persons recognize the value of trees unless they have had a part in raising them. People injure other people's trees as well as their own. He had a young German at work for him who surprised him by his knowledge of trees, and when he inquired how he obtained it the answer was that he was taught it at school.

A vote of thanks to Mr. Harrison was unanimously passed for his instructive and interesting paper.

M. B. Faxon, Secretary of the Committee on Window Gardening, stated that that Committee had found a most encouraging interest in their work. They had received donations of money and fertilizers to promote it, and would publish a large edition of a pamphlet giving directions for window gardening. Mr. Chase, of the same Committee, spoke of the refining influence of window gardening which he had observed in his experience as a teacher. It made discipline easier. The thanks of the Society were voted to those who had contributed to aid in the work of the Window Gardening Committee.

The announcement for the next Saturday was a paper on "Shrubs that are Perfectly Hardy," by Jackson Dawson, gardener at the Arnold Arboretum, Jamaica Plain.

BUSINESS MEETING.

SATURDAY, February 16, 1889.

An adjourned meeting of the Society was holden at half-past ten o'clock, the President, Henry P. Walcott, in the Chair.

James F. C. Hyde, from the Committee on Repairs and Alterations in the Building, read the following Report, which, agreeably to the vote of the Society at the meeting on the 26th of January, had been printed and sent to every member of the Society, with notice that it would be considered at this time:

To the Members of the Massachusetts Horticultural Society:

Your Committee to whom was referred the subject of repairs or alterations at Horticultural Hall, would report that they have given careful attention to the whole matter, and find that there are existing leases on parts of the building, one running ten years, and several others about half that length of time.

They have reason to believe that it would be very expensive to purchase these leases that now stand in the way of taking down the present building, believing that at no distant day it will give way to a more modern and profitable structure.

There remains then, as it seems to your Committee, one of two plans to adopt,— either to sell the whole property, if a sufficient price can be obtained, or, repair and renovate the present building at moderate cost, and retain it for the uses of the Society and for an income, substantially as before the fire.

It is well known to all the members of the Society that the accommodations for our valuable Library are very restricted, and if the Society decides to remain in the building as at present, your Committee would recommend enlarging the room that is now used as a ticket office, removing the partition out to the stair-rail, and so secure, at a small expense, additional room for books.

Further details will be given at the meeting called to consider this report, at which all members are requested to be present. The meeting will be held at Horticultural Hall, on Saturday, February 16, at ten o'clock, A. M.

Respectfully submitted,

HENRY P. WALCOTT,
JAMES F. C. HYDE,
NATHANIEL T. KIDDER,
FRANK W. ANDREWS,
J. D. W. FRENCH,
AUGUSTUS PARKER,
} *Committee.*

Mr. Hyde made a more particular statement of the leases which stood in the way of entire rebuilding, and presented estimates of the cost of the alterations recommended by the Committee.

The report of the Committee was accepted.

The Secretary read a letter addressed to the President by G. Winthrop Coffin, a member of the Society, suggesting that arrangements should be made for holding the large exhibitions of the Society in connection with the Zoölogical Garden to be established by the Boston Society of Natural History at Franklin Park.

On motion it was voted not to take down the building and rebuild.

Robert Manning moved a vote that the Society will not sell its estate at present.

J. D. W. French moved the following amendment:

That the Committee on Finance be authorized to sell the building and land now owned and occupied by the Massachusetts Horticultural Society for a sum not less than five hundred thousand dollars, provided that that Committee shall, before selling, report a suitable location, to be acted upon by the Society.

After a full discussion by a large number of members, Mr. French's amendment was lost by a vote of twenty-five in the affirmative to thirty-two in the negative.

The vote that the Society will not sell its property at present, was then put and carried.

The question then came up on the adoption of the Report of the Committee, and it was moved that it be adopted, and that the sum of $10,000 be appropriated to carry into effect the recommendations therein contained.

Francis H. Appleton moved, as an amendment, that additional room for the Library be provided by the construction of a gallery within the Library Room, and that the sum of $12,000 be substituted for $10,000.

This amendment was carried, and the original motion, as thus amended, was carried.

Mr. Hyde moved that the Finance Committee be requested to have the portraits destroyed by fire, restored as soon as possible.

The President stated that the family of General H. A. S. Dearborn have an original portrait of him, by Stuart, which they are willing to sell.

Mr. Hyde's motion was carried, and it was further voted that the Finance Committee be authorized to expend so much of the money received from the insurance companies for injury to the portraits, as is necessary to cover the expense of restoring them.

Adjourned to Saturday, February 23, 1889, at half-past eleven o'clock.

MEETING FOR DISCUSSION.

Shrubs that are Perfectly Hardy.

By Jackson Dawson, Jamaica Plain.

The first question is: What shrubs can be called perfectly hardy in our rigorous New England climate? I should say: Any shrubs that will live and grow and flower in any ordinary, well prepared soil without any protection whatever, either by covering or by being planted in a sheltered position, and that when once properly established will, with ordinary attention, give satisfaction to the planter. There are many of our finest shrubs that do well if care is exercised in the selection of situation and soil, or if they are protected for a few years, until well established, that would not do well otherwise. But these could not be termed perfectly hardy, neither would they prove satisfactory to the general planter. As a rule he knows nothing of the care required to bring such plants to perfection, but after he has set his shrubs in

the ground thinks that he has done all that is necessary for a successful plantation. He is therefore much surprised in the following spring, to find so many half-dead plants, and often blames the nurseryman for selling him dead plants, when in reality the loss was due to his own ignorance of what were hardy or tender. Many persons when planting new places procure nursery catalogues and make out their lists from them, selecting only such as are represented as most rare and showy, or they may have made their lists from plants which they have seen in horticultural exhibitions, never thinking that they require any extraordinary care in culture or in situation, to produce such specimens as they saw exhibited.

Now this is all a mistake, for many catalogues are deceptive, and the sooner nurserymen and others correct this evil, the better it will be for all. Many planters, after buying plants which are not hardy under ordinary treatment, become disgusted to see them dying off every year, and finally come to the conclusion that the general run of plants-men are dishonest and that it is throwing money away to buy and plant trees and shrubs, when such is not the case. What the public need is trustworthy information, and the catalogues of nurserymen and seedsmen should be good places to find it. What is wanted is an honest description of each plant, and if it has weak spots to have them pointed out, stating whether it needs protection, or a special situation, and in what way. This would make the sales of this class of plants no less, and people would plant intelligently, knowing the place or position in which each would succeed best. Most of those who have had anything to do with planting know that many of our choicest shrubs need special care and protection in our New England climate if they wish to see them succeed. It must not be thought for a moment that I do not advocate the planting of this class which are not perfectly hardy, for I do in their proper places. Many of them are so beautiful that they well repay us for all the labor and care required to grow them successfully.

But the object of this paper is to give a list of those which have grown side by side under ordinary circumstances, through cold and heat, and have stood the test. In a short paper like this one could hardly give the names of all the shrubs that are perfectly hardy, but I will give the best of them, and have no doubt that there will be an ample number and variety from which to select.

Many of them are natives of our own woods and fields, and can compare well with their allies which we import from other lands with so much cost. On many large, as well as small places, they could be used to great advantage, giving a finer general effect throughout the year than many exotics. Before I give you the general list, let us for a moment look over the field and see what we have in our own country. What can be more beautiful than our Kalmia or Mountain Laurel? What compares with those plants that deck our hills and fields from Maine to Georgia, our swamps of *Rhododendron maximum*, and our mountains covered with *R. Catawbiense?* our native Azaleas, such as *calendulacea*, with its various colored blooms from yellow to flame color; *arborescens*, with its snowy white and pink flowers and scarlet stems; *viscosa*, which fills our swamps with its white, fragrant flowers; or *nudiflora*, which grows so luxuriantly on some of our dry hill-sides? Equally beautiful are our fields of Rhodora, with its purple bloom; our Viburnums, with their corymbs of pure white flowers in summer, followed in the autumn by their many-colored fruits, from purple to scarlet, which on some species last well into the winter, enlivening the season when nearly everything else is past.

Then there are our Cornuses, with good flowers and white and blue berries and many colored woods, that are cheering even in winter; the wild Roses, that bloom from June to August; the Sumachs, with their fine tropical foliage and brilliant colored seed-heads; the wild Plums, especially *maritima* and *pumila;* the many American Thorns, which are beautiful both in flower and fruit; our Spiræas, white and purple; the White Fringe; the Clethra, with its fragrant white flowers from July to September; the Hollies, such as the Black Alder in two species, which are beautiful if fruiting specimens are selected, the fruit holding on well into the winter. Even now a specimen in the Arboretum is as brilliant with its scarlet fruit as it was in October. The Ink-berry is a fine evergreen, and especially ornamental as an under shrub, as also is the Halesia (Snow-drop tree or Silver-bell), the Andromedas, the Huckleberries, and the Blueberries; all are useful, and nothing can excel their rich autumn coloring. The Shad-bush, giving almost the first flowers that appear in our woods; the Bar-berry, with yellow, fragrant flowers and scarlet fruit; and the wild Honeysuckles, with scarlet and orange colored flowers, are very

ornamental. Other beautiful hardy shrubs are our native Philadelphus, Potentilla, Hypericum, Rose Acacia, Elderberry, Indigo shrub, Ampelopsis, Bitter-sweet, and many others that I might name that are perfectly hardy.

But I have already taken up too much time, and will now give you a general list of the hardy ones. I shall begin with the Clematis; as there are so many varieties of these, I shall confine myself chiefly to the species.

Clematis Virginiana, flowers white, climber; *C. Pitcheri*, dark purple, all summer; *C. crispa*, pale blue, fragrant; *C. verticillaris*, large, pale purple flowers; *C. vitalba*, England's "traveller's joy," white; *C. fusca* and the variety *violacea*, blue, not showy; *C. graveolens*, flowers yellow, late autumn, seed-pods very showy; *C. Davidiana*, fine porcelain blue flowers, like miniature hyacinths, and fragrant; *C. robusta*, flowers white, September, one of the finest of the late-blooming species. The varieties of *C. Jackmanni* and the other garden varieties are too well known for me to speak of here.

Xanthorrhiza apiifolia is a beautiful low shrub, with chocolate-colored flowers, and fine autumn foliage.

Most of the varieties of *Pœonia Moutan* are hardy, with fine, showy flowers.

The Allspice bush, *Calycanthus floridus*, and *C. lævigatus;* and *Schizandra Chinensis*, a fine climber from China and Japan, with fragrant flowers and scarlet fruit, are all desirable for their fragrance.

Of the Moon-seed we have three species,—*Menispermum Canadense*, *Dauricum*, and *Japonicum;* they are good plants for covering small posts or arbors, the foliage being of a rich green.

The *Akebia quinata* is also a good vine for rock-work or trellises.

Of the species of *Berberis*, the best are *B. Canadensis*, a native; *B. vulgaris* and its varieties, with yellow, red, purple, and white fruit, and the variety with purple foliage. *B. Thunbergi*, a fine low-growing species from Japan, is one of the best of all the species in fruit, being brilliant all winter. *Berberis Sieboldii*, known in the gardens as *B. Hakodaki*, is also a good shrub.

Iberis coriacea and *Alyssum gemonense* are dwarf shrubs with white and yellow flowers.

Hudsonia tomentosa and *H. ericoides*, two native plants, when once established will grow in the most exposed place and the poorest soils; flowers yellow, in June.

Hypericum kalmianum and *H. prolificum*, from Lake Superior, and *H. aureum*, from Tennessee, are the best three and bloom well during the latter part of the summer.

Actinidia polygama, a strong vine from Japan, has white flowers and light green colored edible fruit about the size of a large grape.

Xanthoxylum Americanum (the toothache tree), and *Ptelea trifoliata* have inconspicuous flowers but grand foliage, and the fruit is somewhat ornamental.

Of the Hollies which are hardy we have *Ilex* (*Prinos*) *verticillata*, both red and yellow fruited; *I. lævigata*, with early red fruit, and *I. glabra* (Ink-berry), with evergreen leaves and black fruit; also *Nemopanthes Canadensis*, with rosy purple fruit.

The species of *Euonymus* are all ornamental in fruit, but their flowers, or most of them, are inconspicuous. *E. atropurpureus* is an American species, with rich scarlet fruit. *E. Americanus*, var. *obovatus*, is a low growing species, good for the covering of embankments, or in other places where a low growing species is required. Of *E. Europæus* there are many varieties, with white, yellow, purple, and scarlet fruits, all of which are highly ornamental in the fall. *E. verrucosus* is a small shrub with warty branches. *E. nanus* is excellent where a dwarf plant is required, the autumn and winter foliage being of a rich brown, which makes it very effective for winter work. *E. alatus* is a fine variety from Japan, with winged bark. *E. radicans* and its variety are fine for covering rocks or fences, clinging almost as well as ivy.

Of the Bitter-sweets, *Celastrus scandens*, our native species, *C. punctatus*, and *C. paniculatus* from Japan, all rapid growing climbers and well suited to covering screens or unsightly objects, are very ornamental in fruit (orange and scarlet) in autumn.

Of the Buckthorns, *Rhamnus alpinus* is the most beautiful in foliage; *R. catharticus* is used as a hedge plant, and *R. Frangula* is ornamental, on account of its continuous blooming, which gives the plant a peculiar character, it being covered with flowers, and green, red, and black fruit during the summer.

Ceanothus ovatus, from Vermont, is a neat low shrub with white flowers in June, and *C. Americanus* is a month later; both are valuable in dry soils.

The different species of wild grapes are of great value in covering up unsightly buildings and walls; *V. Labrusca*, *V. æsti-*

valis, *V. cordifolia*, and *V. riparia* are the most hardy. In the Ampelopsis section we have *A. quinquefolia* and its varieties, one of which has sucking tendrils like *A. Veitchii*, and has been called *Engelmanni* by some nurserymen. *A. heterophylla* and its varieties, *aconitifolia* and *serjaniæfolia*, have blue berries.

Æsculus macrostachya is a fine late flowering shrub with spikes of white flowers, excellent in large clumps on a lawn. *Xanthoceras sorbifolia*, a near relation of the above, from China, is very curious in bloom, but is short lived.

Staphylea trifolia, our native bladder-nut, is interesting in fruit.

All the species of Rhus, are fine for large clumps or embankments, and when cut within an inch or two of the ground every year make a very tropical appearance. The species *typhina* (Stag-horn) and *glabra*, of which the *laciniata* is a variety, have fine fern-like foliage. *R. copallina* is one of the finest for autumn coloring. *R. venenata* and *R. Toxicodendron* are well known as the poison ivy and poison sumach or dogwood. *Rhus aromatica* is one of the finest coverings for banks; when once established it will grow in the poorest of soils. *R. Cotinus*, the smoke-tree, is a well known shrub, with mist-like flowers. *R. semialata Osbeckii* is a fine large-growing shrub or small tree from China, with large heads of white flowers in late summer.

Of *Cytisus*, we have *capitatus* with round heads of yellow bloom, and *C. nigricans* with long loose spikes of light lemon-colored blossoms, which appear about the first of July. *C. elongatus biflorus* has round heads of flowers during the early summer. These species are low growing shrubs, seldom exceeding a foot in height.

Of the *Amorpha*, we have *fruticosa* and its many varieties, all of which are coarse growing shrubs with bluish purple flowers, excepting *A. canescens*, the lead plant, which seldom exceeds two feet in height, with spikes of purplish blue flowers and dusty foliage.

The *Wistarias* are all fine climbing plants, well adapted to all purposes for which climbers are used. Of these we have *Sinensis* and *Sinensis alba*, *flore-pleno*, *W. brachybotrys*, and *W. multijuga*.

In *Robinias* we have *R. viscosa*, the clammy locust, with pinkish white flowers in June, and *Robinia hispida*, the rose acacia, with large clusters of pink blossoms which bloom at intervals all summer. There are several varieties of this old-fashioned plant, the difference being chiefly in the size of the flowers.

The species of *Colutea*, or Bladder-sennas, are very ornamental and if well pruned will continue in bloom most of the season; the seed

pods are also interesting. *C. arborescens* has dark brown and yellow flowers, and several varieties have flowers from orange to pale lemon colors.

Halimodendron argenteum is a neat shrub from Asiatic Russia, with clusters of purple flowers in June; it forms a handsome shrub when grafted on *Caragana arborescens*.

The *Caraganas* are a very ornamental class of shrubs from China, Siberia, and Dahuria—all perfectly hardy and free flowering. The species are *arborescens*, *arenaria*, and *arborescens pendula*. *Arborescens* and all its varieties attain a good size. *C. frutescens* and its variety, *grandiflora*, are medium-sized shrubs, with bright yellow flowers. The low-growing species are *C. Altagana*, *Chamlagu*, *pygmæa*, and *spinosa*, with some intermediate varieties. *C. spinosa* is well adapted for small hedges on account of its long thorny branches. The dwarf and trailing varieties make nice heads when grafted high on *C. arborescens*.

In the plum family we have a large variety from which to choose. All are more or less beautiful, and many are exceedingly handsome. The Kansas Sand plum, said to be a variety of *Prunus angustifolia*, is a neat low shrub from two to four feet high, and is densely covered with white flowers in early spring, which are followed by yellow, red, and nearly purple fruit in abundance. This species should attract the attention of our fruit growers, as it begins to bear when less than eighteen inches high.

P. emarginata, from California, is very similar to our wild red cherry. *P. Pennsylvanica*, *P. Virginiana*, and a variety with semi-double flowers, are well worth a place in the garden. The Siberian apricot, *P. Sibirica*, stands well here, and is a fine, sturdy plant, very striking even when out of leaf, on account of its curious colored bark. The varieties of *P. Persica* are short lived when budded on the peach, but are very handsome. They make neat plants and live much longer when worked on the plum. *P. Pissardi* is also a good addition to our gardens where purple foliage is required. *P. Simoni* is a fastigiate tree, with light rose colored flowers and large purple fruit like an apricot. *P. Davidiana* is a rare species from China, with pink flowers. *P. Americana* and its varieties are desirable for large shrubberies; they are beautiful in early spring, and by judicious pruning can be kept at any desired height. Of *P. pumila* we have two forms; one from the great lakes with willow-like foliage, growing five or six feet high, and covered in spring with small white flowers and

in summer with black, cherry-like fruit. This is another plant that might be improved as an eatable fruit. The second form, our common *P. pumila*, seldom exceeds two feet in height. Beside its flowering quality it is one of the finest plants for autumn coloring. *P. spinosa*, *P. spinosa flore pleno*, and *P. myrobalana* and its varieties are all hardy. *P. tomentosa* is a fine rose and white flowered variety from mountains near Pekin. *P. triloba* is well known by all, but its single variety has not been in this country until a few years ago; for the lovers of single flowers it will be a great acquisition. The double-flowering almonds, *P. Japonica alba*, *rosea*, and *multiplex*, are all good shrubs—hardy but short lived. *P. pendula*, when well grown, makes a handsome plant for the lawn. *P. chamæcerasus* is grafted on either standards or near the ground; usually it is grafted high, but when it is grafted close to the ground it makes a much more effective plant for many purposes. *P. semperflorens* continues in bloom more or less all summer. The double-flowering cherries, such as *P. ranuculiflora*, *Watereri*, *flore pleno*, *acida* and others, are well worthy of a place in the garden.

In the genus *Spiræa*, we have good material to choose from. *S. salicifolia* is the parent of many garden varieties, such as *Billardi*, *Leneana*, *latifolia*, *rosea*, *Bethlehemensis* and others. These, if pruned well back every spring, will throw flower spikes of twice the size of those not pruned. *S. Douglasii* is a beautiful species from the northwest; this also has a number of varieties that are very showy. *S. chamædrifolia* and its varieties are good early flowering kinds. *S. millefolia* is a curious, rare species from Nevada. *S. media* and its varieties are the earliest of all the spiræas, except *S. Thunbergii*, which is no doubt one of the finest plants for foliage or flower. *S. hypericifolia*, *S. cana* and *S. savranica* are among the early bloomers. *S. trilobata* and *S. Van Houttei* are two of the best later flowering species. Of *S. Japonica* the forms are numerous, and many varieties are offered by nurserymen. Some of the best of these are *Ruberiana*, *semperflorens*, *superba*, *atrosanguinea*, *glabra*, *alba*, and *Bumalda*. *S. Japonica* has long been known as *S. callosa* and *Fortunei*. They are all late bloomers, and if the old flower-heads are cut off as soon as out of bloom, they will, on good soil, bloom well the second time. *S. sorbifolia* and *S. Tobolskia* are good showy plants with large spikes of pure white flowers in June.

A sub-section of the Spiræas are the *Neillias*. The species *opulifolia* and its variety *opulifolia aurea* are coarse growing shrubs with white flowers. *N. Torreyi* is a low-growing species from Oregon, and *N. amurensis* a fine bold growing species from Northern Asia.

Exochorda grandiflora is one of the most magnificent of our hardy shrubs.

Rodotypos Kerrioides, with white flowers and chocolate colored seed, is a good old-fashioned shrub.

Of the genus *Rubus* there are several that are worthy of a place in the garden; these are *R. odoratus*, the red flowering raspberry, and *R. deliciosus*, the Rocky Mountain raspberry; the flowers of the latter variety are two inches or more across, and pure white; it has never been plentiful, as it is hard to propagate. *R. villosus flore pleno* is rather coarse, but the flowers are quite showy. There are many other varieties of *Rubus* that are hardy, but those mentioned are the most showy ones. *R. hispidus* and *R. Canadensis* are useful to cover the ground in places where few other plants would grow.

Neviusia Alabamensis is a rare shrub, with white flowers in June.

Potentilla tridentata is a neat, low-growing plant with white flowers. *P. fruticosa* is a species with yellow flowers in abundance most of the season.

In the genus Rosa, there are many of the natural species, which are beautiful in their place, and I think it will become fashionable to have a garden of single or wild roses where the ground can be spared. They are seldom much troubled by insects, and one or two syringings will keep them clean for the season; and what with the flowers in summer, and the fruits in autumn and winter, they well repay all trouble by their cheerfulness. Some of the best of the native species are *R. blanda*, *Arkansana*, *acicularis*, *Nutkana*, *Californica*, *Fendleria*, *lucida*, *Caroliniana*, *nitida*, *foliosa*, and *setigera*. *Lucida* and *nitida* are the best two for covering banks or planting as undergrowth for larger plants. *R. foliosa* is nearly yellow and very late. *R. setigera* is the wild Michigan rose, one of the finest of all the single American species, flowering profusely after all the others are done. This is the parent of the Queen of the Prairies rose. Of the foreign single roses, I think the best is *R. repens*, a climbing species growing from eight to ten feet high, with pure white flowers three inches across. *Rosa glauca* is a fine species with pink flowers and showy fruit. *R.*

alpina is the earliest wild rose. *R. acicularis*, *R. cinnamomea*, *R. dumetorum*, *R. canina*, *R. Belgradensis*, *R. rubiginosa*, and *R. tomentosa* are all good species. *R. rubrifolia* has purple foliage, which stands well all summer. *R. Provincialis* is the old French rose, which cannot be equalled for fragrance. *R. arvensis* and its varieties are all desirable. *R. cinnamomea*, var. *Sibirica*, comes near *R. rugosa*. *R. corylifolia* is from Turkistan, and has large white flowers and good habit. *R. Reggeriana* flowers continuously. In the Scotch Roses we have many fine varieties, of all colors; they have neat foliage and are of dwarf habit. A few of the varieties are *fulgens*, *penicillata*, *venulosa*, *pimpinellifolia*, and *vestiflora*. *R. alba* is a fine species with good foliage and flowers. This is the parent of several of our good garden roses. *R. pumila*, from the Minden Alps, is a dwarf species with fine large flowers. *R. rugosa* and its varieties, such as pink, crimson, and white, are worth a place in any garden. *R. Kamtchatica* comes near to *rugosa*, but is even coarser in its habit. The fruits of this and *rugosa* are very ornamental. *R. multiflora Japonica* is very desirable both in flower and fruit.

In *Pyrus* the varieties of *arbutifolia* are very ornamental, such as *pubens*, *serotina*, *grandiflora*, *melanocarpa*, and *erythrocarpa*, which are all worthy of cultivation. With the exception of *erythrocarpa* the fruits are black or brown, and ripen during the latter part of the summer; *erythrocarpa* has brilliant red fruit, which does not ripen until late and hangs on the plant well into the winter. *P. spectabilis*, *P. prunifolia*, *P. baccata*, *P. Parkmanni*, *P. Ringo*, *P. floribunda*, and *P. malus flore pleno* are all showy plants. *P. Japonica* has been improved so much that now almost innumerable varieties can be had, including single red, white, carmine, rose, and other shades of color, beside several semi-double varieties. One of the finest dwarf ones of late introduction is *P. Japonica Maulei*, which seldom exceeds two feet in height and is more floriferous than any of the other varieties.

Cotoneaster vulgaris, *C. acutifolia*, and *C. tomentosa* might be termed perfectly hardy. The flowers of the Cotoneaster are not as showy as some others, but the fruits are very ornamental and last almost all the season.

All the *Amelanchiers* (shad-bushes) are hardy and are the earliest of spring flowering shrubs. They vary much in size, from one to twenty or thirty feet in height. The flowers are white and

the fruit is edible. The species and varieties are *Asiatica*, *alnifolia*, *alpina*, *vulgaris*, and *Canadensis*. In the *Canadensis* section there are a number of well marked varieties. The variety *oblongifolia* has fine edible fruit; the variety *rotundifolia* has round leaves, and in the type the leaves are of a reddish color when first opened. The species *oligocarpa*, from the White Mountains, is the earliest of all.

Photinia villosa is a dwarf shrub with flowers similar to those of the hawthorn and scarlet fruit.

Among the *Hydrangeas* we have a few species that might be termed perfectly hardy; there are *radiata*, *arborescens*, *paniculata*, *paniculata grandiflora*, *vestita*, and *vestita pubescens*. The *vestita* and its variety are the earliest to bloom, and are followed by *radiata*, *arborescens*, *paniculata*, and *paniculata grandiflora*, so that we can have them in bloom from June till September. The climbing Hydrangea is a good addition to our hardy shrubs.

Of the *Deutzias*, we have *gracilis* and *parviflora*, the latter a new species from Japan, with corymbs of white flowers, a few days earlier than *gracilis*.

In the Mock Oranges there are many varieties of good hardy flowers. Some of them are *Philadelphus latifolius magnificus*, a fine variety with large white flowers; *nivalis*, pearly white; *grandiflorus*, a fine large late variety; *Zeyheri*, a variety with flowers not much larger than those of the deutzias; *Gordonianus*, a fine late American species; *microphyllus*, a miniature species from Colorado; *speciosus*, a fine variety; *nivalis*, a very pure white; *Columbianus*, a fine intermediate flowered variety; and *magnificus coronarius* and its varieties. *Schrenkii* is the earliest of all the syringas, and the *grandiflora* section is the latest.

Jamesia Americana is a neat shrub from the Rocky Mountains, growing from two to three feet in height, with white flowers.

Another rare hardy plant is *Fendlera rupicola*, from Texas. This is a low, small shrub.

In the Currant family we have many species that are hardy, but a large proportion of these are only of botanical interest. Among the best for ornamental purposes are *Ribes floridum*, a yellow flowered variety with black fruit; *R. prostratum*, a fine species for rock-work or trailing on the ground; *R. aureum*, the old Missouri currant, and its variety, *palmata;* also *Gordonianum*, which seems to be a hybrid between *sanguineum* and *aureum*. The

species *alpinum* and *saxatile* are the earliest plants to bloom, and enliven the garden when little else is in flower; the fruit is also showy. The varieties *heterophyllum* and *laciniatum* of *R. nigrum* have fine cut-leaved foliage.

Fothergilla alnifolia, a medium sized shrub, is a native of the mountains of our Southern States; the flowers are in round spikes.

Hamamelis Japonica flowers in May, and *H. Virginica* in October and November.

The *Aralias* are fine, tropical-looking plants; *A. Chinensis* is fine for groups on lawns, or other places where a sub-tropical effect is required.

Acanthopanax (*Aralia*) *pentaphylla* has elegant foliage; *A. Cachemerica* is a fine acquisition; *A. ricinifolia*, or *Maximowiczii*, with broad palmate leaf, is as beautiful as many of the greenhouse varieties. Our own *Aralia hispida* is excellent to cover the ground under larger plants. From China we have *Panax sessiliflorum*, another araliaceous plant, with palmate leaves and round heads of curious flowers, followed by large clusters of black fruit, which is very ornamental.

Among the *Cornaceæ* are *Cornus alternifolia*, a large spreading shrub; *C. circinata*, with fine foliage and white flowers and fruit; *C. stolonifera* and *C. sericea*, with blue fruit; *C. paniculata*, with white flowers and white fruit; when this species is trained to a single stem, it makes a much finer plant than when left to grow in its own way. No exotic shrub is more beautiful, either in fruit or flower, than *Cornus florida* and its variety *rubra*. *C. sanguinea* is a low growing shrub with white flowers and black fruit; *C. mascula* has yellow flowers, which are the first to appear in spring; *C. alba* and its varieties, *Sibirica* and *foliis variegata*, have the finest colored woods of all the *Cornaceæ*, especially the variety *Sibirica*, which in winter has bright vermilion colored shoots. All these species are desirable for large shrubberies, being of rapid growth in any good soil, and are ornamental at all seasons of the year, as the flowers, fruit, and different colored woods lend a charm to the landscape.

Among the Elderberries the *Sambucus pubens* is the earliest to flower; the fruit of this species is of a brilliant scarlet, and is ripe about the time *S. Canadensis* is in bloom. *S. aurea*, which is so much prized for its golden foliage, is a form of *Canadensis*. Many make a mistake in planting the golden form in the shade of

other shrubs; to have it in perfection it needs a deep, rich soil and full exposure to the sun. *S. nigra* is the European elder, of which there are several varieties.

Of the *Viburnums*, the American species, with few exceptions, are far superior to those from other countries. *Lantanoides* is one of the finest in foliage, fruit, and flowers, but unfortunately is rather hard to make grow in cultivation; *V. opulus* has large white flowers, similar to some of the single hydrangeas, and brilliant red fruit which hangs on well into the winter; *V. acerifolium*, with white flowers and black fruit, turns to a beautiful purple in autumn; *V. pubescens* is very similar; *V. dentatum* forms one of the finest fringes along some of our country roads; its corymbs of white flowers are nearly as fine as those of the laurestinus, and are followed in autumn by blue fruit in large clusters. *V. molle*, although belonging farther South, is hardy here; the fruit and flowers are similar to those of *V. dentatum*, but are larger and brighter. *V. nudum* and *V. cassinoides* are good dwarf shrubs, with white flowers and fruit changing from light pink when half grown, to blue when ripe. *V. Lentago* and its variety have large corymbs of white flowers, followed by clusters of large fruit which change from red to blue-black in its different stages. *V. prunifolium* is a slower growing species, but very similar to the above. The foliage of all American Viburnums is very beautiful in the autumn. *V. Lantana*, the English Wayfaring-tree, has large corymbs of white flowers, and the fruit is black when ripe. The common Snow-ball, *V. Opulus sterilis*, is well known by all. The variety *nana* is a dwarf form, making a low dense mass of foliage, but rarely flowers. There are many other species of Viburnums, but as yet I have not found them hardy enough to put in this list.

In the Snowberries there are several good species that are ornamental on account of their fruit. *Symphoricarpos vulgaris* has clusters of red fruit; *S. racemosus* and its variety, *pauciflorus*, have white fruit. These are very ornamental in late fall and early winter. The species *occidentalis* is the most showy in bloom, and the flowers are also very fragrant. There is a good variegated form of *S. vulgaris*.

Lonicera cærulea is a native species, of very dwarf and compact habit, with pale yellow flowers, which are followed with light blue fruit at midsummer. *L. oblongifolia* is a small growing bush with pinkish flowers and red fruit. *L. involucrata*, from Utah, is a coarse growing shrub, the fruit being the most ornamental part of

it. Many of our native climbing honeysuckles are beautiful and well adapted to covering fences and trellises, the only objection being that in some seasons the foliage is blasted by a fungus which disfigures the plant; but this is usually in wet seasons, and after the blooming is over. The species are *sempervirens* and its varieties, nearly all of which have scarlet and red flowers; *Sullivanti flava*, and *hirsuta*, which have yellow flowers and very ornamental red and yellow fruit in large clusters; *Caprifolium* or *Periclymenum*, the old Dutch monthly honeysuckle, which used to be in every door-yard but now is seldom seen; and *Xylosteum*, the old Fly honeysuckle, and its varieties, with pink flowers in profusion in early spring, which are followed by black fruit. *L. Tartarica*, the old Bush honeysuckle, is one of the finest of our spring flowers, being free blooming, fragrant, and ornamental in fruit; the best varieties are, *alba*, pure white; *splendens*, with large pink flowers; and *pulcherrima*, with variegated flowers—red, pink, and white; there are many other shades of color, all of which are desirable. *L. Alberti* is a neat, low-growing shrub, with lilac-colored flowers; *L. Japonica Halli*, a fine climbing species with white flowers all summer; *L. Ruprechtiana* and *L. Morrowi* are two Japan species with handsome flowers and yellow and red fruit, which completely cover the plant when ripe, so that it is more beautiful in fruit than in flower. *L. chrysantha* is a Chinese species with yellowish white flowers; *L. Maximowiczii* has pink flowers and red fruit; *L. Iberica* is a sturdy growing species, and the latest of all the bush honeysuckles to bloom.

Diervilla trifida is a native species which is not showy in flower, but makes an excellent covering on shady banks, and has a good autumn coloring. *D. sessilifolia* is a Southern species, with yellow flowers which are quite showy. Of ordinary garden forms of *Weigela* I will say nothing, as they are anything but satisfactory here.

Cephalanthus occidentalis is a fine shrub in cultivation, flowering as freely on high grounds as it does in its native localities along the riversides.

All the Huckleberries and Blueberries do well in cultivation when once established, and nothing can be better than their autumn coloring; two species, *Vaccinium stamineum* and *V. corymbosum*, are very ornamental as flowering shrubs, and the latter is well known as producing valuable fruit.

The Bearberry, *Arctostaphylos Uva-Ursi*, is an excellent trailing plant and will grow in the poorest soils when once established, but it needs time and patience.

Epigæa repens (the well-known Trailing Arbutus or Mayflower) can be grown successfully if nice clumps are selected and grown in a frame or greenhouse one season; it does best in a northern aspect, or will do well if planted on the edge of rhododendron beds.

Cassandra calyculata also does well in cultivation, and is easily handled; this is one of the earliest spring flowers.

Oxydendron arboreum belongs to the Heath family; it is a fine shrub if well treated, flowering in late summer, and in autumn becoming a deep red.

Andromeda floribunda is a neat evergreen shrub with white flowers, which are among the first to appear in spring. *A. ligustrina* is a rather coarse shrub, with flowers not showy but hardy.

Erica carnea makes a neat plant at the edges of rhododendron beds.

No shrubs are more showy than the *Kalmias*, especially *K. latifolia;* the only drawback to their cultivation is a lack of shade; although they grow well in the open sunlight, the foliage becomes somewhat browned in winter, especially on a thin soil. The little *K. angustifolia* makes a nice plant in cultivation if the roots are kept cool, and the same may be said of *K. glauca*, which is the prettiest and earliest of the Kalmias.

Leiophyllum buxifolium is the Sand Myrtle, and a charming little evergreen, hardly ever exceeding a foot in height.

Ledum palustre is another of the dwarf *Ericaceæ;* it has rusty foliage and white flowers. All these little ericaceous plants need a good deep soil; if it can be made light with peat and sand so much the better. They are all hardy enough, and will stand the sun well if due care is taken of the roots.

Rhododendron maximum is the latest of all rhododendrons, blooming in July; this is one of the finest shrubs to plant in the vicinity of lakes or ponds, although it does well in other situations. The varieties of rhododendron that have Catawbiense blood in them are the hardiest. I will attempt to name only a few, as others here have had more experience in that line than myself. Those that I have are Album grandiflorum, Atrosanguineum, Charles Dickens, Charles S. Sargent, Everestianum, General Grant,

Kettledrum, H. W. Sargent, President Lincoln, and others of which I have not made note. I have no doubt that many of our rhododendrons are hurt by the drying winds in March more than by the extreme cold, for in all situations where buildings or trees cut off the keen winds many varieties grow well without any protection. *Rhododendron Dauricum*, variety *sempervirens*, stands well without protection.

Of the Azalea section we have *calendulaceum*, with bright orange and flame colored flowers; *Rhodora*, purple; *arborescens*, white and pink; *viscosum*, white; and *nudiflorum*, rose; beside the Ghent varieties, which are hybrids between *R. flavum* and *R. calendulaceum*.

The *Clethra alnifolia* does well in all situations, from the hillside to the swamp, and is covered with its fragrant flowers during July and August.

Symplocos paniculatus is a new shrub from Japan, with clusters of small white flowers in June, and in autumn with bunches of berries of an ultramarine blue. I have never seen the fruit of any shrub with so fine a color.

Halesia tetraptera, the Silver-bell, is a desirable native shrub; nothing can be more beautiful or graceful than a large plant of it in full bloom.

Of the *Styrax* family, *Styrax Americana* is the best; it is a neat round-headed shrub, with drooping white flowers.

The *Forsythias*, with their golden flowers in early spring, are well worth a place in every one's garden. The species are *suspensa*, *viridissima*, and *Fortunei*.

Chionanthus Virginica, with long bunches of fringe-like white flowers, is also a good hardy plant.

Every one loves the lilac; it seems as if it were the special spring flower. It has been worked over so much that there is no end to its varieties, both double and single. To name the whole of these would require almost a catalogue by itself; so I will only call your attention to a few varieties: Alba grandiflora, Albert the Good, Cærulea superba, Charles X, Marie Lagrange, Verschafeltii, and Philomel. So far as I have seen the last one is the finest dark variety of the *Syringa vulgaris*. Other species are *S. Emodi*, a coarse growing variety with purplish flowers; *S. Josikæa*, with very dark purple flowers, borne after most of the other species are done; *S. villosa*, from China, a shrub of medium

height, good foliage, and lightish purple flowers produced in June; *S. pubescens*, from Pekin, with small heads of purplish flowers; *S. Persica* and its variety, *alba*, with large loose bunches of light purple and white flowers about the last of May; *S. Chinensis*, a plant of more erect habit than *S. Persica*, and longer truss, with light purple flowers in May and the first part of June; *S. Amurensis*, a medium sized bush with clusters of white flowers about the middle of June; and *S. ligustrina*, variety *Pekinensis*, a rapid growing small tree of graceful habit, but which has not as yet flowered in this country. There is also a pendulous variety of this species. The Japanese lilac is one of the most majestic of this genus of plants. It is clean in its growth; no insect seems to touch it, and it is grand in all its proportions; the heads of flowers, which appear in July, are white and are from twelve to fourteen inches long, and broad in proportion. The largest plant is now fully eighteen feet high, and when it is in bloom in July is magnificent.

Of the *Ligustrums*, *Ibota* is the most graceful; the flowers are white, in single drooping bunches; *L. Amurensis*, which is said to be a variety of this, is of a more erect habit, both in growth and flower. Of *L. vulgaris*, the common Privet, there are several varieties, with white, yellow, and green fruit, but the general habit of all is the same.

Lycium Barbarum and *L. Chinense* are two fine climbers for covering unsightly places; they bear small purple flowers, followed in autumn by brilliant scarlet fruits, which hang long after the hard frosts have killed the foliage.

The Dutchman's pipe, *Aristolochia Sipho*, is another excellent climber.

Lindera Benzoin is a good shrub in large plantations; its yellow flowers open in early spring before the leaves; these are followed in early autumn by scarlet fruit.

Of the *Daphnes*, the hardiest is *D. Mezereum*, a neat shrub with purple or white flowers appearing before the leaves, and fruit at midsummer of brilliant red. There is a variety with white flowers.

Dirca palustris, the Leather-wood, has bright yellow flowers before the leaves appear; the autumn coloring of the foliage is a bright yellow.

The Silver-trees are fine objects in the distance, in landscape planting. *Elæagnus hortensis flava* and *E. songaricus* are small trees

with silvery foliage, and yellow fragrant flowers in summer. *E. longipes* is a low growing shrub with rusty leaves, greenish yellow flowers, and fruit of a dull red, mottled, about the size of a cornelian cherry, and quite palatable to those who like a fruit combining sweetness and acidity. *E. argentea* is a neat medium-sized shrub with small silvery leaves, and fruit covered with a greyish bloom.

Hippophae rhamnoides and *H. salicifolia* are two good plants near the sea; the flowers are inconspicuous; the foliage is of a silvery gray.

Myrica Gale and *M. cerifera* are excellent plants to grow as under-shrubs, or to plant on dry, sterile places. The same can be said of *Comptonia asplenifolia*, the Sweet Fern.

Empetrum nigrum and *E. corema* are not showy, but can be used in deep sandy soils to form a carpet; they become dense mats of green, much resembling the heather when out of bloom. They are somewhat hard to handle, but when once established do well.

I have no doubt that there are many more plants which might be added to this list as perfectly hardy, but those I have mentioned are the ones which, when tried by the side of others, have held their own under ordinary treatment.

BUSINESS MEETING.

Saturday, February 23, 1889.

An adjourned meeting of the Society was holden at half-past eleven o'clock, the President, Henry P. Walcott, in the Chair.

No business being brought before the meeting it

Adjourned to Saturday, March 2, 1889.

MEETING FOR DISCUSSION.

The Embellishment of School Grounds.

By Leverett M. Chase, Master of the Dudley School, Roxbury.

The public school is distinctly an American idea. When the principle that our government rests upon the consent of those governed was established, popular education became a necessity. The enormous expense of our school system is more cheerfully

borne than any other public burden. Our system of education is in many respects the best in the world, and recent events have clearly shown how dear it is to every true American, and with what jealous care it is defended and protected. The high estimation in which we hold our schools has perhaps made us too conservative and rendered us too unwilling to make changes to bring them into line with the most advanced educational thought. The wisest and broadest educators feel that our system is not as practical as it should be; that many courses of study are not in line with the duties that must devolve upon every man and woman.

Many college graduates are utterly unprepared to perform life's most common duties. They know a great deal but cannot use their knowledge. Important faculties and powers have never been developed and trained, and these persons find their so-called education as cumbrous as David found the armor of Saul.

But, to generalize no longer; there are two important particulars to which our schools should give most earnest and immediate attention,— manual training, and natural science, or the study of the facts and phenomena of nature.

The latter brings me to the consideration of the theme for this morning, "The Embellishment of School Grounds" which I shall chiefly consider from an educational stand-point.

If we desire to render our school premises attractive and a public ornament, there is nothing which yields so great results for a small expenditure as the decoration of the surrounding grounds. Costly construction and the finest and most skilful architectural design are to a great degree of no account, if the surroundings are not in proper keeping, or are neglected.

The educational influence of a fine public building with grounds laid out with good taste is great. Among a number of examples I will mention the city of Toronto, Canada, one of the handsomest on this continent, the beauty of whose school and other public grounds, made beautiful by tree and flower planting, is celebrated throughout the world. The result is that a great majority of the homes, whether magnificent or mean, are adorned with fine trees and flowers. If the influence on mature natures is so great, what must it be upon young children, whose tastes and habits of thought are not fixed! The celebrated Locke declared that he gained more ideas before he was five years old than in all the rest

of his life, and the Jesuits say that if they can have the education of a child until he is seven years old they do not care who teaches him afterwards. Indeed the permanence of early impressions has become a proverb. We cannot then begin too early to establish right conceptions of moral and natural beauty in the hearts of the young.

How little has been done to educate the young by rendering their school surroundings beautiful and attractive. In how many school yards you cannot find a tree, vine, or shrub, or even a perfect blade of grass—the surface when wet, mud; when dry, dust; lacking the conveniences required for comfort, and in some cases for decency and good morals.

Let us now turn from what *is* to what ought to be. Every school-house should have ample space around it for light and ventilation, for exercise and for beauty. Children have an inalienable right to enough space to insure health, happiness, and physical development.

Even in cities, where the cost of land is great, it would be far wiser, if economy must be practised, to diminish the superfluous ornamentation of the houses and to increase the size and beauty of the school grounds. Many of the school-houses in this city would be far more attractive had they been properly located and had a few dollars been expended in planting trees and shrubs about them and improving the lines of approach. To have taken a few acres of our vast and expensive parks, so located as to be inaccessible to ten thousand of our school children, and sub-divided and added them to our school grounds would have been an act of wisdom. But I would have both parks and sufficient school grounds. Our youth, to whom play is as natural as breathing, are daily more and more circumscribed and restricted.

The opportunities for ball-playing, coasting, skating, and, indeed, every form of active, vigorous amusement, are rapidly diminishing. Our youth are unable to engage in physical labor as can country children, and time hangs heavy on their hands. The vast throngs that crowd the five-cent and ten-cent museums, to witness the most disgusting and corrupting displays, do so at first, because they have no better way to occupy their leisure hours. The recent words of the school committee man who, in reply to the charge of lavish expenditure for schools, declared that "a child is at least as valuable as a paving stone," deserve immortality.

School grounds should be separated into two distinct portions—one for an out-door gymnasium, and devoted entirely to that end; the other should be devoted to turf, trees, shrubs, flowers, and walks. Pupils should be taught that everything which adds to the beauty of this place must be carefully preserved. Every plant should be labelled and catalogued, and most carefully nurtured. The play grounds should have seats against the fences, a shelter shed for protection from rain and heat, and a supply of pure water. All out-buildings should be screened by lattice work or better by climbing vines like the woodbine, Virginia creeper, etc. Pupils should be early led to take an interest in the cultivated part of the grounds. They will soon love the plants and learn how to care for them. When this occurs, thefts and destruction of flowers, so common in many places, will almost entirely disappear and most happy results will come, in the evident elevation and refinement of the moral sentiments of our children.

Except in the State of Connecticut, almost nothing has been done to adorn the country school grounds of New England. Many of these, with an expense of five dollars per year, would in ten years be rendered exceedingly beautiful, and would make a net return of at least an hundred fold in the improvement of the premises and in the intellectual and moral development of the community. But the most important advantage of these improvements is the use to which they can be put in practical instruction. A great fault in our system of education is that it is almost exclusively literary. Habits of accurate observation and a knowledge of the phenomena and facts of nature are almost unknown.

We have no end of books, many good of their kind, but the book which should be our primer and throughout life our constant companion, is as little read as many family Bibles. Though interesting, comprehensible, adapted to every age and grade of mind, indispensable to our best enjoyment of life, unsectarian, superbly bound and illustrated, and free to all, the Book of Nature is almost never read. The great natural division of vegetable life, the connecting link between animal and mineral existence, is almost never even noticed. The great majority of our people, with all their opportunities for knowledge, know almost nothing of vegetable life, the mode and manner of vegetable growth, its important relations to our comfort, health, and even life, and its influence upon our moral and spiritual natures.

We can hardly begin too early to instil the knowledge and establish the habits which will largely determine the future success and happiness of our children, and greatly contribute to the strength and prosperity of our nation.

Rightly improved, trees, vines, shrubs, and flowers can be made most important auxiliaries in instructing and developing our young children, furnishing means for numberless object lessons, even in our primary schools. Such lessons are learned without effort, and even with delight, by children who find other school tasks irksome. I have been told by several persons that they first learned to love school through their nature lessons. Such instruction will never be forgotten, and will produce important results in mature life. In the words of that excellent paper "Garden and Forest," "Appreciation comes with knowledge, and until our people learn about our trees, their value, their qualities and uses, the history of their lives, their distribution and relationship to the trees of the rest of the world, they will neither really appreciate nor value them, nor learn to care for and protect them. If there is ever in the United States a stable, successful, and popular system of forest control, and forest management, applicable alike to the forests of the state and to the humble wood-lot of the smallest farmer, it will rest upon a basis of a knowledge of trees and their importance to the community, commenced in the primary schools. If our cities and villages are ever properly adorned with well selected trees, well planted, and well protected, this will be brought about through an appreciation of trees, born of seed planted in country school-houses."

God's plan of education first of all presents to the young child the Book of Nature. Its perceptions become conceptions; relations and causations follow as naturally as the "blade, the ear, the full corn in the ear." The waste and cruelty of expecting children to do the mental work of men are wholly reprehensible.

Nature is the first teacher. Her lessons are all object lessons. Her lovely form and melodious voice attract the eye and charm the ear of infancy. The golden sun, the silver moon, the stars, the falling snow, the rainbow, the boundless ocean, awaken in the young child ideas of wonder, love, and beauty.

Set the child down in the lap of Nature in the midst of flowers, with the trees, mountains, and the blue arch of sky above him. Let him hear the songs of birds, the soft breathing of spring, the

sighing of autumn, the blast of winter, and his education is properly begun, and not till then. Nature is the child's counterpart.

> "All Nature's objects have
> An echo in the heart. This flesh doth thrill,
> And hath connection, by some unseen chain,
> With its original source and kindred substance.
> The mighty forest, the proud tides of ocean,
> Sky clearing hills, and in the waste of air,
> The starry constellations and the sun,
> Parent of life exhaustless, these maintain
> With the mysterious and breathless mould
> A co-existence and community."

What better improvement of approaching Arbor Day can be made than by planting some beautiful native trees in the school grounds, or along the road-side? What more important and interesting lesson can be given, than upon the genesis, growth, and economical, sanitary, and æsthetic value of trees?

How the wisdom and goodness of God are shown in the life and growth of the tree! How much in common with our lives have the lives of trees! The spirit of the woods is most inspiring to the soul. Their silence and tranquility wake meditation and devotion. "The groves were God's first temples." Solomon loved trees and planted an arboretum. He knew them all, from the stately cedar of Lebanon to the hyssop on the wall. Moses, the greatest man of ancient Bible history, commanded: "When thou goest out to besiege, or make war on another nation, thou shalt not destroy the trees, for the tree of the field is the life of man."

Classic song catches its inspiration from trees. The rustic poet sings under "the wide spreading beach tree." Homer gives soul to trees and peoples the groves with dryads. Wanton destruction of a tree was an impious act, and often, as in the case of Erisichthon, severely punished, while those who like Rhœcus spared and protected them were richly rewarded by the woodland fays. Xerxes, invading Greece, halted to adorn a plane tree with jewels and ornaments of gold, and appointed a sentinel to watch over it.

How full of expression are many trees. Who cannot see strength and firmness and endurance in the oak that has withstood the storms of a century; or dignity and queenly grace in the stately elm? What grand associations cluster about Boston's

Liberty tree, or the Great Elm on the Common, or the grand tree at Cambridge under which Washington took command of the American army; or the Treaty Elm of William Penn; the Charter Oak at Hartford; the Apple tree of the Appomattox!

How the thousands of birds that once filled the air with their melodious songs have left us, and instead have come countless myriads of noxious insects, that seem likely to devour every green thing. The destruction of our forests is the destruction of our birds; the destruction of our birds the destruction of our gardens and fruit.

In these remarks I have sought to avoid repeating the usual and far more important reasons for the promotion of forestry, and shall be glad if I have made the slightest new contribution in aid of this important work, upon whose successful prosecution our national prosperity depends.

The time is near when, as in Germany, there will be connected with all our school grounds, cultivated portions, in which can be found flowers in bloom, from the early snowdrop to the late blooming chrysanthemum; and typical specimens of our finest native trees and shrubs, and small beds of broken ground where seeds can be sown from which children may see the mystery of germination and plant development. These will serve the double purpose of beautifying the premises, and affording aid in practical instruction in natural science. It would also be wise to associate these trees with interesting events and the names of great and good men, as a just and beautiful expression of love and honor, and an incentive to rouse the rising generations to noble and beneficent lives. Especially should we plant and preserve trees in the great centres of population "where wealth accumulates and men decay,"—those great mælstroms that more and more suck into their terrible vortices our rural population, where the unfortunate little ones are instructed by almost universal example, that the chief end of man is to get money, and what luxury, vice, and fashion it can command,—and not to "get understanding."

Religion, philanthropy, patriotism, gratitude to our progenitors, justice to our posterity, self interest, science, and wise foresight, all demand that we shall train up the young to love, plant, nurture and revere trees.

The beneficent Father who adorns the lilies and numbers the very hairs of our heads, has given trees and flowers for our good,

that we may reverently receive and richly enjoy them, and at last render a good account of our use of them.

Discussion.

William E. Endicott said that it might seem to some not a practical thing to have flowering plants in school yards. His experience, when a boy, was precisely opposite; there was a strip of ground three feet wide around the school yard, planted with flowers which bloomed through the season, beginning with the snowdrops, narcissi, and tulips in the spring, and continuing until the frost destroyed the asters and marigolds. This was near a manufacturing village, and it can be done now where the grounds afford room, as well as in Canton forty years ago. If plants are to be cultivated in school-rooms, they should be judiciously chosen, so that interest could be maintained through the year, and the janitor should be interested, as it is necessary to leave them to his care during vacations, etc. Succulent plants, such as cacti, stapelias, crassulas, and sedums would be most eligible. Nearly all the narcissi would be valuable.

Rev. Calvin Terry considered the subject under discussion a most important one; it touches the foundation of all good citizenship. He had had a good deal to do with schools; the care of buildings and grounds is too much left to janitors, and the scholars do not come so near to Nature as they should. School grounds are too much neglected, and he had been in school-rooms where there was no air fit to breathe, owing to the neglect by those in charge. A great defect in our schools is that it is made the aim to see who will get the highest mark, so that instead of education we have merely inculcation. A set of vandals is training up among us; children should grow up with the feeling that a tree or a flower is sacred, and that the needless destruction of woods in which they have spent many happy days is a wrong. The existing state of things may be the fault of the teachers in some cases, but its prevalence shows it to be a fault of the system. Many teachers think they have not time to give instruction in natural history, but if properly qualified they would find time for this important instruction and our schools would be made more useful by it.

Marshall B. Faxon held that teaching the young how to care for plants is most important. The Committee on Window Gar-

dening have voted to do what they can to carry out the principles laid down by the essayist. They have visited and examined school grounds, and in the first one visited they found in the centre a place ten feet square, prepared for planting a tree in the coming spring. A border around the yard will also be made ready, and be filled with flowers.

Mrs. H. L. T. Wolcott said it had often been supposed that an attempt to improve school grounds would be met with the answer: "It cannot be done;" but she believed that if they were prepared and planted in good order, the boys as well as the girls would care for them. She asked what protects the flowers in the Public Garden, and expressed the belief that it is the children's love for flowers. The cases of injury are few and exceptional; children will steal flowers sometimes, but so will women, and even a man has been found guilty of it. If an expression of the sentiments of this Society upon this subject went out to the public, its influence might prove largely beneficial. Children accept the facts of nature better than do grown people. Little children should be taught more of those facts, and not be left so ignorant of them as to accept as truth, many idle, fanciful whims that are current among the uneducated.

Francis H. Appleton thought every successful attempt to improve school grounds and similar places should be reported for the encouragement of those who may contemplate similar action. He then gave an interesting account of a successful effort within his cognizance. A chapel and a school-house stood near by in an open field. By subscription, money enough was collected to buy trees for the purposed planting, and last Arbor Day the young people, thirty-five years of age and under, assembled, dug the holes, and planted one hundred white pine trees on the north side of the grounds and maples in front of the buildings. Most of these trees are living and in good condition now. Such improvements can be easily brought about in other places as well. When in Austria, Mr. Appleton saw school yards having the rear grounds shaded by trees, while at the sides and front there were beds of seedling trees and shrubs in variety, or of flowers. During recess the teachers mingled with the students and interested them in object lessons based upon these plants.

William H. Hunt spoke of an instance in which permission was obtained to plant trees in a school yard. The children subscribed money for the purpose and the trees were planted. Teachers and

children took a strong interest in the matter, and enjoyed the trees and the plants that came later. Children always take interest when they have a chance. It is necessary to use judgment in planting, that trees shall not interfere with the light, and that nothing offensive shall arise from the presence of the plants.

William D. Philbrick stated that in Newton improvements similar to those mentioned by the last two speakers had been made, and there is a very good feeling in regard to ornamenting school grounds. What has been done there has been mostly with trees and shrubs, and the results have been excellent. Plants have been cultivated in the school-rooms, and when the janitors have taken sufficient interest in them to care for them during vacations they have flourished. The great difficulty in the way of object teaching from plants, is that very few teachers are competent to give practical lessons in plant culture out of doors.

Rev. A. B. Muzzey remarked that there is a great deal said about public schools now. He thought we should aim and strive so to improve them that all children educated in the public schools should have a fully developed character. It is a melancholy truth that many boys will sooner injure a tree than cultivate it. If we can induce children to cultivate trees and flowers they will feel a love for them; the heart follows the hand. But we must take another step back of that; we need to have teachers who understand and love the cultivation of plants. In the examination of teachers regard should be had to their taste and capacity in this direction. They should be prepared and disposed to cultivate in their pupils a sense of beauty and a sacred regard for Nature. These are fundamental points in the character of boys and girls, and our schools should develop them.

Samuel Hartwell said there is a new school-house to be built in his town, Lincoln, and he wished to know how much land ought to be taken to carry out the ideas suggested by the essayist and others. He would have room for the boys to play base-ball, and and thought there should be an acre and a half or two acres, especially if flowers are to be cultivated, and that the law should be so amended that school boards might seize more than the half acre now allowed. He thought it important that children should be trained to love and cultivate plants; he loves to see them himself and wishes that such a love might be encouraged and that more of our farms might be embellished with them.

Mr. Chase suggested that this Society might give an important impetus to the good work by offering prizes for the best kept school yards.

The Chairman of the Committee on Publication and Discussion announced for the next Saturday, a paper upon "Plums; their Cultivation and Varieties," by Ex-President James F. C. Hyde.

BUSINESS MEETING.

Saturday, March 2, 1889.

An adjourned meeting of the Society was holden at half-past eleven o'clock, the President, Henry P. Walcott, in the Chair.

The following votes, offered by Francis H. Appleton, were unanimously passed:

Voted, That the Massachusetts Horticultural Society hereby respectfully signifies its hearty approval of the efforts being made by the present Legislature, at the recommendation of the Governor, to secure the improvement of the roads and road-sides in our towns and cities, and expresses the hope that such efforts, whether they result in establishing a Road Commission or otherwise, may meet with success.

Voted, That a copy of this vote be sent to the Chairman of the proper Committee of the Legislature.

The following named persons, having been recommended by the Executive Committee for election to membership in the Society, were on ballot duly elected.

Mrs. E. M. Lancaster, of Roxbury,
Arthur W. Tufts, of Roxbury,
Silas Potter, of Roxbury,
Mrs. C. Stedman Hanks, of Boston,
Artemas Frost, of Belmont.

Adjourned to Saturday, March 9, 1889, at half-past eleven o'clock.

MEETING FOR DISCUSSION.

Plums: Their Cultivation and Varieties.

By Ex-President James F. C. Hyde, Newton.

At the earnest request of your Committee we consented to write a brief paper giving some of our observations and experience in growing this fruit.

We need not go into the history of the plum but we know that it has been long under cultivation and has reached a high standard in size, quality, and productiveness.

Forty or fifty years ago there was no more difficulty in growing plums than in growing apples, though we had fewer varieties than now. A change came, and the trees dropped their fruit and also became infested with black knots, so that in many orchards plums entirely disappeared. Like the yellows in the peach the cause of the warts or knots was, for a time, a mystery. Some have supposed they were caused by the curculio that destroys the fruit, because the larvæ of that insect are often found in the knots when they are in a green state. It is true that the curculios lay their eggs in the growing excrescence just as they do in the growing fruit, prompted by instinct to propagate their species. There are other theories entertained as to the cause of the black knot, but whatever the cause of this disease the average farmer or fruit grower became discouraged and no longer attempted to grow plums, while the few who were able to do so obtained large prices for their fruit.

To many the loss of this fruit was thought of little consequence, while others regarded it as one of the best grown. While it may not be as healthful a fruit as some when eaten freely in an uncooked state, it is certainly one of the best for preserving or canning, and we should not like to lose it altogether from the lists of fruits for our climate.

The greatest drawback to plum growing is the black knot. In many cases the trees are utterly destroyed almost before they have given even one good crop. They become nearly covered with this unsightly and destructive fungous growth if left to themselves. Not only is the plum liable to injury from the black knot but some other trees as well. The fact is that in order to succeed

in raising plums one must successfully fight the black knot. How shall it be done? We know of no better way than to prevent it so far as possible by keeping the trees in a thrifty and healthy condition. To do this the land must be made and kept rich. Even under the most favorable circumstances the knots will after a time appear. The trees should be frequently examined during the growing season, and as soon as the fungous growth makes its appearance it should be cut off and burned. If it appears on a small limb or twig, sacrifice the limb, but if on a large branch cut off the wart and cut deep enough to remove the whole of it. Heroic treatment is required if one would save his trees. Bad wounds must sometimes be made, but better so than to allow the warts to remain. Some recommend the application of shellac to such wounds, but we never take the trouble to do this as we do not expect to keep the trees for many years.

If the trees make a very thrifty growth it is well to head them in just before the buds start in the spring, so as to keep them stocky and symmetrical. We have had many trees that would make an annual growth of from five to seven feet from the ends of the main branches. We usually cut back rather more than half of such growth and in some cases back to within a foot of the old growth. This of course with the high manuring we give the land stimulates a large growth the same season, but this we rather like because we think the trees will be freer from warts than if less thrifty. Many regard the curculio as the great enemy of the plum, to which opinion we do not assent. There is not much difficulty in contending successfully with the "little Turk," who if left alone it is true would make its crescent mark on every fruit on every tree in the orchard. If the trees are left to themselves and no measures are adopted to prevent the ravages of this insect no crop will be obtained as a rule, but it is so easy to take preventive steps that one has no excuse for not doing so if he cares for his crop.

We have no new plan to suggest but will briefly describe our method of circumventing the persistent insect who "plays 'possum" so successfully. We have iron plugs made, the head an inch and a quarter square or a little more, and about three inches long, tapering nearly to a point. We bore a slight hole into the body of the tree and drive in one of these plugs about half the length of the plug. This iron receives the blow of the mallet used

to jar down the insects. Soon after the blossoms have fallen from the trees and the small fruit may be seen, we take a mallet of good size, such as can be used with one hand, with a handle three to four feet long; a piece of cloth — the smoother the better — say from three to six feet wide according to the size of the trees, with a strip of wood on each side and end to keep the cloth in place. The strip of wood on one side of the cloth is in two pieces and the cloth has a slit about half way of its length, running half way through its width, so that when the cloth is in place for jarring the tree, the body or trunk of the tree will be at about the middle of the cloth; when it is so placed one of the two holding the cloth will strike the head of the iron plug with the mallet and instantly the cuculios, if there are any, will drop down on the cloth, rolled up in a little ball looking like anything but a winged insect, but a good deal like a ripe hemp seed.

After jarring three or four trees in this way the insects that have fallen on the cloth can be shaken together, and then turned into a pail partly filled with water with a little kerosene on top, where they soon perish. Some use a mallet covered with rubber or other soft material and strike directly on the limbs of the trees. This way may become necessary where the trees are quite large. The object is to shake down the insects and destroy them in the easiest and quickest possible way.

Some go through their plum orchards and only shake the trees, and so disturb but do not destroy the pests. Still others sprinkle their trees when wet with air-slaked lime or ashes and so secure some fruit, but there is no plan so effectual as the jarring down on a cloth and destroying the insects on the spot. This jarring must be done every morning for from four to six weeks if the insects are numerous, requiring about an hour each morning for a hundred trees.

If the work of jarring has been faithfully performed and the trees have blossomed well and set fruit, much labor may be required to thin it. This should be done in some cases to save the trees from the effects of overbearing and to secure good sized fruit.

There are many good varieties of this fruit, but for market we should advise the planting of very few sorts. We have found that a large blue plum sells better than a green or even a red one. The public will not buy a delicious Green Gage so quickly as they will the large showy Bradshaw.

For market purposes we should name the Bradshaw, which is a large, early, purple variety of fair quality, that always sells well because it is large and handsome and also because it may be put into our market before it is supplied from New York and elsewhere. The tree is a thrifty upright grower and comparatively free from the black knot.

Smith's Orleans is of good size and showy, covered with a deep purple bloom, and sells well though only of fair quality.

The Lombard is a well known fill-basket variety, of medium size and fair quality. It is a reddish purple in color and the tree is an enormous bearer. This variety needs to be thinned to secure fruit of good size.

We are inclined to stop here for market sorts, but if a yellow plum was to be added it would be Prince's Imperial Gage.

For home use we should make a different selection,— Green Gage, Washington, Jefferson, Yellow Gage, Reine Claude de Bavay, Lawrence's Favorite, McLaughlin, and possibly a few others.

The plum crop is not so reliable as the pear or apple though more profitable under favorable circumstances. In addition to the drawbacks that we have enumerated it sometimes happens that when the fruit is grown and nearly or quite ready to be picked, unfavorable weather will cause the plums to crack, after which they will soon decay and loss follow.

We do not advise extensive planting of plum trees except by those who are favorably situated and are willing to take pains to secure good results.

Discussion.

On the conclusion of Mr. Hyde's paper, Leverett M. Chase inquired whether arsenical poison had been tried here for the curculio. Reports of good effects from its use had come from Michigan and Iowa. The curculio is comparatively absent in California, but as you go north to Salem and Tacoma in Oregon, they increase. Mr. Chase thought the exemption of California was closely related to the extremely dry weather there.

Caleb Bates said that when he was very young he found the crescent mark of the curculio on plums, but never saw a description of the insect until Downing's "Horticulturist" was published. Plymouth was formerly a favorable place for growing plums, but

afterwards the curculio came, and not only destroyed the plum crop, but caused apples to drop and left its mark on pears. They are now gone, however.

E. W. Wood had hoped the essayist would be able to tell us how to get rid of the black wart, the greatest enemy to the plum tree. For some years after he joined the Society he hardly saw a dish of plums shown, but after that Mr. Dutcher of Hopedale exhibited collections of twenty or more varieties, and later the speaker visited his grounds, where he found half an acre planted with plums and enclosed with a wire fence to confine hens therein. The hens destroyed the curculios, but the black warts had come in to such an extent that the trees were much cut and mangled to get rid of them, and some were reduced to mere stumps. Mr. Moore's experience at Concord was the same, and now the speaker does not know of any considerable plantation. If we could only get rid of that one disease, the plum would be one of the most profitable fruits. It is still grown extensively in the Hudson River Valley. Experiments are being made at the Agricultural College with liquid applications to destroy the black wart, on which they are not yet ready to report. Where it is not convenient to jar trees, Mr. Wood approved of enclosing the plum orchard and putting in hens to destroy the curculio.

Mr. Hyde said that he could not count upon more than two or three good crops of plums before the trees will be rendered worthless by the black warts, as you cannot count upon more than one or two crops from a peach orchard. But he had headed in his plum trees when they had become badly infested with the warts; the trees then sent out a new growth and he got altogether five or six crops. The warts come more upon some trees than others. His trees are now six years old from the bud, and he has had a growth in one season of five, seven, and even nine feet. He sold Bradshaws for eight dollars per bushel, and a hundred dollars' worth from sixty or seventy trees on a piece of ground about one hundred feet by two hundred. Some varieties are more inclined to rot than others. If intended for market the fruit must not be allowed to get too ripe. Everybody is attracted by beauty, and large, handsome plums sell best. He wished it understood, first, that plum trees must have a suitable soil — a heavy stiff soil is the best; and, second, that we must fight the curculio, which has not yet disappeared. Hens are a partial preventive.

To combat such enemies to our fruit crops is what we are here for. Ellwanger & Barry, the great Rochester nurserymen, some years ago had a crop of four or five hundred bushels of plums; their trees were from fifteen to eighteen feet high, and they kept three men fighting the curculio for from four to six weeks. Professor Lincoln had tomatoes under plum trees which were exempt from the curculio, and he recommended planting tomatoes as a preventive, but his trees stood where they overhung water, and it turned out that this, and not the tomato plants, was the cause of exemption.

Mr. Bates said that it is sixty years since he met the curculio, and last year he did not find a mark. He believes that the use of the knife will subdue the black wart. He once had a tree which burst with black wart. He bought some trees including Green Gage, and one of these developed black wart. He cut off the affected part, and has had none since.

Rev. Calvin Terry had no doubt that the black wart is caused by an insect. Besides the plum he had seen another shrub that grows along the highways infested with it.

Mr. Hyde said that the black knot is not produced by an insect, though insects come out of them. They are found on the choke-cherry and other wild species of Prunus.

William D. Philbrick said that the black knot had been a subject of scientific investigation by Dr. Farlow, who decided that it was caused by a fungus.

Mr. Bates thought that the curculio might be frightened from the plum trees. In apple and plum trees hanging over the highway, both plums and apples were free from them.

Mr. Hyde said that a battery of artillery could not frighten them; they are here to propagate their species and they will do it if they can.

Mr. Bates wanted to know if they were intelligent enough to avoid trees overhanging water. He thought the exemption of such trees might be explained by the water being uncongenial to them; either by its motion alone, or the sound produced by the motion, or by the flashes of reflected light which came from it, they were frightened away. They are remarkably timid insects.

Mr. Chase said that the fruit on one side of trees planted near water had been punctured by the curculio, while that on the other side was not; they are intelligent enough for that. The manner in which it "plays 'possum" when disturbed is evidence of its

intelligence. He put some in vials with water and they were very lively the next morning. This beetle is well shielded and well calculated to make its way in the world. Fighting it every morning for six weeks is very laborious. Nectarines are attacked by it and all plums except little wild ones. He had noticed that some varieties of pears are attacked by the curculio more than others. Spraying the trees has been successful, and the ravages of this pest have been much diminished by the use of arsenical preparations.

Mr. Wood said that arsenic had been more extensively used in the West, especially in Michigan, than here, and some claim that it is effectual. Professor Fernald, who lectured before the Society last year on injurious insects, believed in it for the codling moth, but not for the curculio, as after the egg of the latter is inserted in the fruit the aperture is closed by the growth of the fruit, so that the egg is beyond the reach of the poison.

Mr. Hyde said that plums of the Wild Goose class (varieties of *Prunus Chicasa*) seem to resist the curculio. Those who can be content with moderately good plums may plant these and be almost sure of a crop. He has a tree of the Newman, one of these varieties, which gives him two bushels or more of fruit. Moreover they scarcely wart at all.

William H. Hunt said that he has plum trees in his hen yard and the hens keep down the curculio. It is a sufficient remedy if there are hens enough. The only enemy is the black knot, which it will be impossible to exterminate so long as there are hundreds of acres of pastures filled with choke-cherries. He allowed his plums to get too ripe at first to send to market.

Mr. Bates said that he had seen a variety of the plum called Illinois, in which the fruit swelled into a fungus. They have almost invariably done so.

Robert Manning said that he had seen this abnormal growth; what should be the fruit becomes a membraneous sac. It was described in Hovey's Magazine for 1838, page 247, by Dr. T. W. Harris, who attributed it to a little thrips — a minute insect.

Mr. Manning went on to speak of his experience in raising plums, of which he had many years ago a large collection. The black wart was the only trouble, and until this came in like a flood he kept it under pretty well. But cutting this off as soon as it appears means pruning in the growing season, and half the top

of a large tree cannot be removed at that time without serious injury. So he was obliged to leave them, and pruned them off early in spring. Since then Professor Farlow has discovered the cause of the trouble in a fungus, *Plowrightia* (*Sphœria*) *morbosa*, described in the "Bulletin of the Bussey Institution," vol. 1, p. 440. It appears from this that the fungus is propagated by several kinds of spores, one of which matures in the winter, and the speaker said that if he had known this and pruned off and burned the warts as soon as the trees became dormant in autumn he might have destroyed these winter spores and doubtless checked the spread of the fungus.

Samuel Hartwell said that he had grown plums on sandy soil and got good crops. He spread a cloth under the trees to catch the curculios, and caught a few. His trees have overborne, and when this happens they must be thinned or they will rot. The knife is effectual for a time in keeping down the black knot.

Joseph S. Chase said that he grows his plum trees in dwarf form, by grafting a thrifty seedling, about five-eighths or three-quarters of an inch in diameter, using a scion with four or five buds. The grafting is done near the crown of the root. In case any one bud grows faster than the others, he nips off its end, checking the growth and making a tree of upright form, branching at from six to eight inches from the ground. This method keeps the tree wholly within easy reach. He advised clean culture, and in the spring of each year the application of about a pint of salt around each tree. To protect the trees from the curculio he uses finely sifted coal ashes, which he sprinkles with a scoop over the whole tree in the morning, before the dew is off. This is commenced when the blossoms fall, and is repeated every four days or immediately after a shower, until the fruit is about one-third grown. For the black knot or wart he thought prompt amputation of the part affected imperatively necessary, and that it should be thoroughly done even if it takes the root. Mr. Chase grows eight varieties of plums, but of all kinds he prefers the Reine Claude de Bavay, both for the table and for market.

Mr. Hyde thought air-slaked lime better than ashes. The best time for grafting plums is early, say during the month of March.

Mr. Bates thought any fine, dry dust as good as ashes or air-slaked lime.

Mr. Manning said that he had found the *Prunus myrobalana*, some of the varieties of which have lately been recommended for

planting as ornamental trees, exceedingly subject to the black knot, and he advised caution in planting them. He recommended the Drap d'Or as a very fine early plum for family use; it is too small for the market. He did not agree with the essayist that Smith's Orleans is only of fair quality; he thought it one of the best.

President Walcott said that the black knot has close analogy with some diseases in man, and, as with those, there are two points to be considered — first the cure of the individual, and second, the proper healing of cut surfaces so as to exclude infection. A surgeon is very careful not to leave an open cut, lest disease should be communicated to it; and so when a black knot is cut out, if the wound is not covered you have provided a resting place for spores. He asked why those who wished to exterminate the black knot should be subjected to danger from their neighbors. He would have worthless trees infested with black warts destroyed, as we take a person who has smallpox to the hospital to prevent the spread of the disease.

Mr. Hyde suggested that the wounds made in cutting out the black knots should be covered with a solution of shellac.

Mr. Wood said that any ordinary paint would be equally good for the purpose.

[The following letter from Charles V. Riley, was read at a later meeting of the Society, but as it contains valuable information relating only to the subject of discussion at this meeting, it is inserted here as a part of the proceedings.]

United States Department of Agriculture.

Division of Entomology.

Washington, D. C., March 8, 1889.

Mr. L. M. Chase,

Master of the Dudley School, Roxbury, Mass.,

Dear Sir: Your letter of the 7th inst. asking certain information regarding the plum curculio has been received. In reply I may briefly state that the black knot of the plum is not caused by the plum curculio, although this insect occasionally breeds in the black knot. This excrescence is a fungous growth and the scientific name of the fungus is *Plowrightia morbosa.*

There can be no question as to the advantage of spraying plum trees with some one of the arsenical mixtures. The adult beetles feed somewhat in the early spring and in mid-summer, and spray-

ing the trees soon after the blossoms fall will kill a certain proportion of them. The entire subject has been treated at some length in the Annual Report of this Department for 1888, which is now going through the press, and a copy will be sent you when it is published.

Yours truly,

C. V. Riley, *Entomologist.*

The subject for the next Saturday was announced to be "Certain Phases of Domestic Economy — Dust and Dampness," by Mrs. Ellen H. Richards, Instructor in Sanitary Chemistry at the Massachusetts Institute of Technology.

BUSINESS MEETING.

Saturday, March 9, 1889.

An adjourned meeting of the Society was holden at half-past eleven o'clock, the President, Henry P. Walcott, in the Chair.

No business being brought before the meeting, it

Adjourned to Saturday, March 16, 1889, at half-past eleven o'clock.

MEETING FOR DISCUSSION.

Certain Phases of Domestic Economy — Dust and Dampness.

By Mrs. Ellen H. Richards, Instructor in Sanitary Chemistry, Massachusetts Institute of Technology.

Mrs. Richards began by mentioning some of the different kinds of dust. Arctic explorers have found cosmic dust everywhere that they have gone, and the study of the phenomena following the eruption of Krakatoa fully proves that the dust from that volcano was disseminated world wide. It is now pretty well settled that fogs are composed of moisture collected around minute particles of dust in the air. Then there is the dust blowing about the streets today, filling our eyes and irritating our lungs,—a dust which corresponds to the dictionary definition.

This is composed mainly of mineral matter, and is not injurious except as it is irritating. As it sifts into our houses, it is the bane of careful housekeepers.

It has been known for a great while that there were other constituents of dust than mineral matter, and the question what and how much is an important one. Aristotle pronounced dust injurious; all dry bodies which become damp, and all damp bodies which are dried, he said, engender animal life. After the discovery of the microscope, the theory of animalcula and the spontaneous generation of them ruled the world. A mixture of flour and water set out in the air will ferment, and a bit of bread or cheese will in a night be covered with mould. The quickness of such growths seems magical, and it was asked how it could be possible unless the germs grew spontaneously, but we now know that it is due to an immense number of exceedingly minute spores. Pasteur, about thirty years ago, showed how dried bodies which became damp engendered life. Pouchet had found that when a tube was heated so as to destroy all germs and then inverted over mercury, organisms were developed in it, but Pasteur in 1864 showed that the dust which clung to the mercury and that which was suspended in the air carried the germs of life into the apparently sealed tube. He rendered this dust visible by darkening a room and allowing a beam of light to enter through a tiny opening. This is the dust of the house, which falls on everything. Everyone knows that dust is visible in a beam of sunlight when none can be seen elsewhere in a room, and the careful old New England housekeeper thought that sunshine brought in dust, and so shut up the best room and kept it dark, and also damp and musty, which conditions caused the organisms in the air to increase at the rate of many thousands in twenty-four hours.

It is now well recognized that air everywhere contains the spores of moulds and bacteria, and air free from them is only to be found on the tops of high mountains and perhaps at sea. Many of them are too small to be seen by the microscope.

The amount of this matter and its effects are important, but we know very little about them, except that these fine particles are everywhere. If a pan of flour and water is set out-doors, enough yeast germs will fall on it to cause it to ferment. In-doors, in dwelling-houses and public halls, and wherever people come together, spores are found. They may be divided into moulds

and bacteria, both needing a certain amount of moisture and food to propagate. Dry bread will not mould; moulds must have moisture to increase, but they require very little food. Probably there is food enough for them in any room, however clean. In August we finds moulds springing up everywhere, showing that the germs are everywhere.

Mineral particles are found in great excess in the air of cities. One investigator tried by the process of fog-making to estimate the number in a cubic inch. In a rainy day he found 521,000; in fair weather 2,119,000; in the air of rooms 30,318,000, and near the ceiling 88,346,000 in a cubic inch. This dust is not usually dangerous.

It is only quite recently that processes have been devised for the determination of the number of living organisms or of their spores in the air. Those interested in the subject will find a full discussion in Mr. G. R. Tucker's admirable paper on the number and distribution of micro-organisms in the air of the Boston City Hospital, printed in the Twentieth Annual Report of the Massachusetts State Board of Health.

All investigators agree that while the particles of dust are so abundant in out-door air the number of living organisms is very small, ten litres (about two gallons) of air containing as a rule from ten to fifteen, and this holds good for Dundee, Scotland, and London, England, as well as for Boston.

The number increases near the ground; for instance, Dr. Percy Frankland found that the air taken at the height of the top of the dome of St. Paul's, contained only ten organisms in ten litres, while air from the base gave thirty-five, and that from the surface of the ground gave forty-seven organisms for the same amount.

But when houses and public buildings are examined, the results are quite different. Professor Carnelly found at Dundee, Scotland, that the air of the more roomy and clean houses contained from 160 to 180 micro-organisms in ten litres, while that of the smaller and dirtier houses had from 400 to 930.

Mechanically ventilated schools gave much better results, the cleanest having only thirty organisms and the worst only 300, while in some of the schools for poorer children there were 910, in schools of average cleanliness 1,250, and in dirty schools 1,980.

It was supposed that the number of organisms would depend wholly on the cleanliness of the rooms, but it was found that

while in schools opened before 1885, there were only 380, in those opened before 1880, there were 1,500, and in those opened before 1866, there were 3,110. This showed that the number depended partly on the age of the room, and that the increase was due largely to propagation in cracks, etc., where the dust was not easily dislodged. Architects should consider this point in constructing buildings. The lodgment of these fine dust particles has not been heretofore taken into consideration. They are composed largely of spores, which when moist will begin to multiply rapidly. Our uncomfortable feelings in a room are due largely to these, and not merely to carbonic acid gas. Decay always gives off gases, which are not as good to breathe as pure air. As much dust from the top of a dining-room door as could be taken on the point of a pin contained 3,000 living organisms, which is not pleasant to think of, for among so many germs we may get some harmful ones.

It becomes important to find under what conditions we can have fewer of these germs. At the City Hospital, Boston, a large number of experiments have been carried on to determine this point. (See the Twentieth Annual Report of the State Board of Health of Massachusetts, page 161.) The rooms are swept three times and wiped over twice daily, and the average number of organisms in two gallons of air averages ten, but one who tests the air can tell whether a patient has been lately taken up and his bed been shaken, for in that case the number rises to forty or fifty. In a school in Scotland where the number was ten, the boys were told to get up and stamp on the floor, which increased the number to 150. Experiments in Scotland showed that these micro-organisms do not come from the breath or the person, but from the building.

The great lesson in domestic economy to be learned from the facts which have been mentioned is that dust cannot be wholly got rid of, but it should be removed as thoroughly as possible. A feather duster will not do this. Bacteria settle more rapidly than moulds, and if, after two hours had been allowed for them to settle, all surfaces could be wiped off with a damp cloth, it would be a good way to remove them. Modern rooms with carpets and upholstery furnish fine resting places for dust. Anything from which a footfall will raise dust favors the propagation of bacteria. The lecturer did not see how to get rid of dust as long as we keep carpets nailed down.

The conditions for the propagation of bacteria are very favorable in houses without cellars. The Michigan Board of Health reported a case of poisoning by milk. The family was poor but tidy. Their house was an old frame house long known as unhealthful; the sills were on the ground and there was no cellar under it. Rain water collected under the floor of unjointed boards; sweepings collected in the cracks, and the floor was scoured and mopped and the water ran through, and kept the dust in the cracks moist. A corner of one of the two ground floor rooms was parted off as a pantry, where the milk was kept, and here a second floor had been laid over the rotted boards of the first, and it was impossible to reach the mass of decomposing moist material beneath. There were three fatal cases in a family of four, and it was decided with certainty that the poisoning by the milk was due to the germs from the damp and mouldy floor.

In another case some ice cream was made, and a part flavored with lemon was frozen immediately. The remainder was flavored with vanilla, and stood for some time before freezing in an old decayed and damp building which had been used as a meat market, but had for months been unopened and unoccupied. The latter caused a great deal of illness.

To get rid of the disadvantage of dust we should have things as dry as possible. We should have sunlight and air in our rooms, even if it does involve the admission of dust from the street, which is much less harmful than the bacteria. The raising of dust should be avoided. Dampness should also be avoided. Sanitary experts often object to very dry air in a room, but from this point of view it is an advantage.

The question how far the great quantity of organisms that we breathe is injurious has not been decided. It seems probable that for persons in perfect health the majority are harmless. The ciliated epithelium of the respiratory passages probably sweeps them out as fast as they become entangled in the mucus with which it is bathed. Even those which have penetrated as far as the trachea and bronchial tubes are thus probably ultimately swallowed. It seems scarcely possible that any can ever reach the air cells. The conditions are different, however, when there is even a slight catarrh of the respiratory passages. The bacteria in air are then probably a source of considerable danger. In our

usual household life they may not do much harm, but we never know when they may become harmful. More attention might be given to getting rid of dust in public halls than is the case. If the sexton dusts a church Sunday morning, the trampling of many feet raises much more from the carpet.

We now know that the conditions of growth of the dust plants are those of all plant life — warmth and moisture, with the further condition that light is not necessary. It is doubtful whether light is in itself harmful to them, but light places are dryer than dark ones. So, while a certain amount of air is needful, an excess of air is not favorable,—probably because an abundant circulation of air means dryness and often coolness.

The great question of modern housekeeping is how to protect ourselves from these plant growths, and the answer is, first, not to furnish them food, and, second, not to furnish the conditions of darkness and dampness under which they thrive. Sun and air are our best allies. Dr. Carnelly says, "Cleanliness, both of the person and more particularly of the dwelling or school, is of the very utmost importance in maintaining purity of air as regards micro-organisms, and one which from this point of view has not been previously advocated. Though far from depreciating the beneficial effect of abundant air space, yet we think that the frequency with which the air of a room is changed is a far more important point to be attended to in providing a pure atmosphere."

Discussion.

Benjamin P. Ware said that the remarks of the essayist on cosmic dust and fogs suggested that not only our beautiful sunset effects, but the wonderful after-glow of the Alps, and possibly the "yellow day" of September, 1881, may all be due to fogs and volcanic emanations.

Mrs. Richards said that a great advance has been made in the study of beautiful sunsets, after-glows, etc. More attention has been paid to these phenomena since the "yellow day," and especially since those gorgeous "red sunsets" of a more recent date. The investigations which were instituted to discover the cause of the last named manifestations, have satisfactorily settled the question in the minds of the most eminent scientists of both Europe and America. They accept the theory that those brilliant

colors were due to the presence of volcanic dust in the higher regions of the atmosphere.

Mrs. H. L. T. Wolcott remarked that while Mrs. Richards was speaking, she had been much exercised in her mind by considering, in connection with what the lecturer said, the condition of the Society's building, and also the relation which the statements made bore to domestic housekeeping. She thought one might as well die of bacteria as in an insane asylum, to which excessive care in housekeeping led. Some years ago a family in Dedham were attacked with diphtheria, which proved fatal to four out of five children. No other person than the tired mother could be found who would take care of them, for love or money. As she had two or three grandchildren, her family were very fearful that they might take the disease, if she helped to care for these children. She did it however, but after leaving the sick-rooms for home she took long walks and shook her clothing thoroughly in the open air. None of her family took the disease then, but long after that time she was stricken down with it, and one of her grandchildren also. The physician who attended them wished to look over the house to see if he could discover the cause of their sickness. The cause was plainly visible, as it came from neglect of sanitary conditions in that locality, in respect to wells, vaults, and cesspools. Therefore the speaker thought that people who thus cause diphtheria to be developed in their own or neighboring families should be indicted for criminal neglect. While, however, it continues to be the fashion to use heavy curtains, stuffed furniture, and velvet carpets in our houses, the penalty must be paid. Therefore it is only by incessant labor and watchfulness on the part of the housekeeper of today that the consequent multiplication of these pestilent microscopic plant and animal germs can be rendered harmless.

Mr. Ware said that he had felt as Mrs. Wolcott did, that life would hardly be worth living if one thought that he was in constant danger from bacteria and must spend his life in fighting them. London has been supposed to be the smokiest, dirtiest city in the world, yet medical authorities consider it the safest place in the world for amputations.

Mrs. Wolcott asked if London really is the dirtiest city in the world. When she was there she found the streets cleaner than were the floors of some public buildings. The dust was removed

from the street even at the risk of the lives of those men who had to work under the carts and horses feet in the crowded streets to do it.

President Walcott said that London and Paris are two great cities,—the former outwardly dingy, while the latter, so far as outward appearance goes, represents absolute cleanliness. London was formerly dirty, but for the last thirty years a marvellous change has been going on until it has become the cleanest large city in the world, and the death rate is lower than in Paris.

The lesson to be learned from what has been said today is that it is utterly impossible to get entirely rid of dust, and, paradoxical as it seems, perhaps we could not exist if we did. If we disinfect the air of this room we destroy the life of every human being in it. We must strike the balance of inconveniences, and take the least. The conclusion of the whole matter is, *keep clean.*

William C. Strong suggested that sulphurous acid gas, which destroys mildews and other fungoid growths, might destroy the lower forms of animal life which have been mentioned in this discussion.

President Walcott said that in dealing with mildew and similar fungi we have plants very easy to destroy; but bacteria are very difficult to destroy, and when we come to the spores it is almost impossible to destroy them; some of them have survived a temperature above that of boiling water.

Mrs. Richards remarked that if the walls of a room could be washed down with a solution of sulphurous acid it would be better than merely to have the air impregnated with sulphurous gas.

President Walcott cited one laboratory experience as showing how difficult it is to destroy the bacteria and other organisms which are found in dust. In this laboratory an investigation was made of the bacillus of anthrax. During the time occupied in that work the laboratory became stocked with the spores of that bacillus, and as all efforts to eradicate them proved futile, the whole establishment was rendered useless for further scientific research in this direction.

Mrs. Richards stated that, with other substances, dust sometimes contains the pollen of plants. Its composition is influenced by local causes. The "red snow," of the Arctic regions, takes its color from the spores of algæ, which are carried over it by the

wind. These are very different in character from the dust which is visible only in sunbeams, and which settles very slowly.

It was announced that on the next Saturday a paper on "Horticulture and Design in the Surroundings of Houses," would be read by Charles Eliot, landscape architect, of Boston.

BUSINESS MEETING.

Saturday, March 16, 1889.

An adjourned meeting of the Society was holden at half-past eleven o'clock, the President, Henry P. Walcott, in the chair.

No business was brought before the meeting and it

Adjourned to Saturday, March 23, 1889, at half-past eleven o'clock.

MEETING FOR DISCUSSION.

Horticulture and Design in the Surroundings of Houses.

By Charles Eliot, Landscape Architect, Boston.

The recent enormous increase in the variety of the products of the plant nursery has supplied the designer of house-surroundings with much new material, but has not affected the main principles of his art. Without counting fruit trees, an ordinary American nursery catalogue now offers for sale some five hundred sorts of trees and shrubs and an equal number of herbaceous perennials. The demand for nursery-grown plants — that is for plants trained to bear moving—is great and growing.

Possibly the time may come when thousands of trees will be wanted for timber plantations, but at present in America the first and foremost use for nursery-grown trees is the provision of shelter from cold wind, or hot sun for men's houses and crops. Almost two-thirds of our country must plant trees for this purpose, and Western nurserymen will be called upon to grow vast numbers of quick and hardy sorts. To shade and adorn streets trees must also be wanted. In the more or less arid West they are particularly needed, and there they will be planted even though irrigation

must be introduced to support them. In moister climates trees which do not shade a road too darkly will prove best.

A second source of the demand upon the nurseryman is the desire for table fruits. In spite of adverse climates, black rot and curculio, men will doubtless continue to grow apples, pears, peaches, and berries of ever better sorts and in ever larger quantities. In the West experiment must go on for many years, before the kinds best adapted to the various climates can be discovered and proved; and in the East the limit of improvement is by no means reached.

A third great source of the demand for plants springs neither from the need of shelter nor the desire for pleasant food, but from the love of plants as beautiful or curious objects. Beginning in this country with the introduction of Lombardy poplars, lilacs, a few roses, and a few perennials, the desire for beautiful or striking plants has grown continuously and prodigiously, encouraging nurserymen to discover and grow trees, shrubs, and herbs from every temperate climate of the earth, and prompting them, as each new thing becomes in its turn common or well known, to offer some yet more striking novelty, derived perhaps from Asia or Japan, or else developed from a rare form of some old friend. Fine bloom has been most desired; accordingly sorts which produce striking flowers have been introduced from abroad in great numbers, and these have then been improved by zealous cultivators, until the parent species has come to seem commonplace. Fine flowering perennials are now offered in innumerable varieties, and the number of conspicuously blooming trees and shrubs exceeds one hundred. Remarkable foliage has also been sought out and developed. Fifty or more sorts of cut leafed and colored leafed trees and shrubs appear in the catalogues; many coniferous evergreens are grown for their colors, and the foliage plants of the herbaceous tribes number hundreds. Uncommon form or habit too has its admirers. The so-called weeping and fastigiate trees now number more than thirty, and some of these add fine bloom and pretty foliage to their more or less graceful or graceless shape.

I must leave the horticultural journals and the catalogues themselves to describe, as best they may, the marvellous wealth of beautiful forms and colors which a great plant nursery now contains. Progress in arboriculture and horticulture has become amazingly rapid; and if just now the growing of the familiar but

handsome native trees, shrubs, and herbs, is sadly neglected, this is the one regrettable tendency to be noted. I know it is often maintained that the growing of "dwarfs," "fastigiates," "weepers," and purple leafed and colored trees is itself a regrettable, not to say a shocking violation of good taste and of nature. It would seem, however, as if these critics of the nurserymen must be ignorant of the fact that all these so-called monstrous forms were somewhere originated by nature herself, and that it is in the use which is made of them, and not in the art of propagating them, that the possibility of gross sin against good taste is to be found.

Turn now to the scenes which the treasures of the plant nursery are to shelter or adorn. Late years have witnessed great movements of city population to the suburbs and the country. An out-of-town house may be surrounded by something of that country quiet which the tired workers of the cities find so refreshing. It may, moreover, have light and air on all its sides. Once so-called rapid transit is provided, it is no wonder that thousands make their homes in the suburbs; and it is equally natural that those who can afford it should spend the hot summers in the open country or by the sea. To the architect the country house and the suburban house present problems very different from those he is called upon to grapple with in the city. Out of town he meets with endlessly differing conditions of situation, of exposure, of prospect, and of aspect; and he finds almost unlimited opportunities for the exercise of ingenuity and taste. That American citizens and architects are taking advantage of these opportunities does not need to be said. One well designed house built in a given neighborhood becomes the forerunner of a dozen others. Such a new birth of interest in architecture and in the principles of architectural design as has been witnessed in America in the last few years, the world has seen only once or twice before.

The out-of-town house has more or less land about it, — land which the city man buys presumably not only in order to keep other houses at a distance, but also for the purpose of providing something pleasant for his eyes to look upon. This ground about the house, whatever be its character or area, must necessarily be more or less altered from its natural state as soon as the house is set upon it. At the very least, its undulations must be brought to meet the rigid ground line of the architectural structure and its surface must be crossed by the path to the house door. Generally

the natural scene must undergo other and more considèrable changes. Trees must be felled to make a way for the approach road or to admit sunlight to the house; slopes must be cut into to allow the road to pass along them and hollows filled so as to remove standing waters; ground must be made smooth for the growing of fruits and vegetables, and so forth.

If, now, a man desires that his surroundings, after suffering these necessary changes from their natural state, should be, like his house, convenient and at the same time beautiful as possible, he has upon his hands, whether he knows it or not, a problem of very considerable difficulty. When his house is finished, his house-scene is by no means complete; and unless his house has been designed as a part of the house-scene, — that is with careful reference to the parts surrounding it,—the final effect is almost sure to be disappointingly fragmentary and ineffective. Few architects and fewer house owners yet realize this. Indeed the ordinary practice is to design and build suburban and country houses without much thought of the surrounding scene, — often without consideration of so practical a matter as the grade of the way of approach. Commonly such necessary appendages as the laundry-yard and the carriage-turn are not thought of until the house is up, when it is likely that they cannot be so conveniently arranged as they might have been, had they been thought of earlier. As for the beauty of the house-scene, although it is so generally desired it is very seldom planned or arranged for. It seems commonly to be regarded as something to be added to the scene, after the house and roads or paths are built, — probably by making a lawn and inserting flower beds and specimen plants, no matter what may be the nature of the ground.

The growing appreciation of design in architecture must work a reform here in time; meanwhile it will be well to insist upon two fundamental facts,—first, that real beauty of scene is never derived from added decorations but must spring directly from the shape and character of the scene itself; and second, that this true beauty can be attained only when the house and its appendages and its surroundings are studied and thought out together as one design — one composition.

Both the country seat and the suburban lot may illustrate the truth of these propositions. A suburb is a district in which roads and houses dominate the landscape. In the typical case the

ground is smooth and flat, the streets and boundaries straight, the separate ownerships by no means large. In such neighborhoods the architect's share in the making of the scene is so predominant that an error in the choice of the style of the house is almost necessarily fatal to the effect of the house-scene. Where the surroundings are mostly formal, much irregularity either of building or of ground always seems out of place and affected; unless, indeed, nature has by chance supplied a site which by its steep slopes or its rockiness conquers the surrounding formality and compels to the picturesque. A many-angled and many-gabled building on a smooth site in a straight-bounded inclosure is out of keeping; and so also, in the same situation, is a tangle of bushes and bowlders and a sharply curved approach road. This does not mean that where the streets are curved or for any reason a house door is easiest reached by a curved line, the curve must be forbidden and the path or road made straight; but it does mean the shunning of all purposeless curvature, such as is often to be seen in most suburbs. Awkward and breadth-destroying lines of approach are the rule in the suburbs, and the architect is often responsible for them, for he frequently places the house door in such a position that the path or road leading to it must necessarily cut the ground before the house into lamentably small pieces, and he does this, too, when a little thought might perhaps have brought about that happiest of all arrangements, in which a stretch of grass as long or longer than the building is brought without a break up to the house wall itself. No subsequent planting can obliterate mistakes in these controlling elements of the suburban house-scene, the house and the approach; and no planting can accomplish what it otherwise might, if by reason of unmindfulness of the effect of the house-scene as a whole, the framework of the scene is wrongly put together.

It is seldom that a suburban lot, after the house and approaches are built, retains much of its former vegetation. A few large trees may survive the necessary gradings, but the natural ground covering is generally killed out. On the completion of the grading grass is sown, and from the resulting sheet of green the house walls and the boundary walls or fences rise abruptly. It is exceedingly surprising to see, as one may everywhere, well designed houses, adorned within with much rich ornament and probably inhabited by people who appreciate art and nature, standing thus

naked in naked enclosures. The contrast between a handsome building and bare surroundings is sufficiently obvious in summer, but in winter, in this New England climate, it becomes positively startling, so that it is difficult to understand how educated people can fail to be impressed by it, and how they can longer refuse to comprehend that the house and the house-ground should be treated in the same spirit.

From another point of view this miserable nakedness is equally surprising. Here in the suburbs is an opportunity for adding to all the usual advantages and ornaments of city life the new and delightful pleasantness of verdure, fragrance, and bloom. As a matter of fact it is an appreciation of this opportunity that causes the first plantings in most suburban grounds. Trees and shrubs, selected for their profuse flowering or their striking habit, are set out here and there, and brilliant beds of flowers are perhaps added. Desire for ornament of this sort, like some other desires, grows by what it feeds on and causes the pressing demand upon the nurseryman for plants of marked appearance of which I spoke before. The effect upon house-grounds resulting from planting undertaken in this spirit is everywhere to be seen, and is generally unfortunate. Specimens of many sorts planted promiscuously on a lawn compose an interesting though ill-arranged museum, but not an appropriate setting for a house. They wholly destroy all that breadth of effect, which it is so difficult but so important to preserve in small grounds; if they grow large they interfere with the prospect and the aspect of the house, and whatever their size, they give the scene the appearance of having been adorned to make a show, and remind one of the saying of the Greek sculptor, who charged his pupil with having richly ornamented a statue, because he knew not how to make it beautiful.

An ambition to possess a collection of handsome, curious, and rare plants, like the similar passions for shells or minerals or precious stones, is entirely praiseworthy and honorable, and may well be indulged *ad libitum*, provided a place can be set apart and fittingly arranged for the purpose, as cabinets are prepared in-doors for collections of curios of all sorts. Out of doors, a flower garden is such a cabinet, and there is no reason that tree and shrub gardens should not be similarly arranged by those who desire to grow many striking sorts. In formal and highly decorated pleasure grounds specimen trees are already used in this way and with good

effect. Before stately buildings and in connection with terraces and formal avenues, appropriate specimens are always in keeping; but in New England house-scenes not especially arranged to receive them they destroy the last hope of good general effect.

With what object, then, should the planting of the suburban house ground be planned?

I answer, with the object of helping the building and the other controlling parts of the scene, to form an appropriate and pleasing whole. In the very smallest front yards one thing which should seldom or never be omitted can be accomplished just as well as it can be in grounds of larger area — that is the connecting of the house walls with the ground by means of some sort of massing of verdure. Shrubs planted near the base of the house wall remove at once all appearance of isolation and nakedness, and nothing can help a building more than this. There, if nowhere else, some evergreens should be used; and it is fortunate that in a climate in which hardy evergreens are few, the stiff sorts like the box, the arborvitæs, and the junipers are all entirely appropriate in close connection with a building. The more irregular the structure, the more varied in detail may be these wall plantings, but if the house is of formal design, a hedge-like row of bushes may be best. The older houses in many New England villages often have bushes set thus along their walls; and at the Longfellow mansion in Cambridge the same purpose is accomplished by a low terrace balustrade, half covered by creepers.

In grounds a little larger than the smallest, the securing of some breadth of effect by means of grass should be attended to, next after the wall plantings. If there is space enough to get this openness and at the same time to have some bushes near the street line as well as next the house, so much the better. Plant nothing which will grow to a size disproportionate to the scene. Large trees on small lots are not only inappropriate, but they shade the ground excessively and make it difficult to grow the indispensable ground-covering of shrubs. Maintaining sufficient openness, plant shrubs again against the naked fences, or grow climbers on them if space does not permit of anything more. In larger grounds give the house a setting or background of appropriate trees. Where, as in New England, climate keeps deciduous plants leafless half the year, plant for effect in winter as carefully as for the summer; use all possible broad leafed evergreens and all the cheerful fruit bearing and colored stemmed shrubs, and for summer add various

sorts of foliage and bloom, but keep the whole scene to its own appropriate style, admitting brilliant decoration only in detail and conspicuous single objects only rarely if at all. If many flowers are desired they should be grown in a garden, or in formal beds close beside the formal building. The permanent scene can be helped only in its details by the temporary beauty of bulbs and herbs.

To appreciate that a house-scene depends for real effectiveness upon its general design and not upon decoration, one need only look upon some such ground as that of the Longfellow place before mentioned, where the planting consists of two elms supporting the sides of the house, creepers covering the balustrade at its base, and lilacs flanking the balustrade and forming a hedge along the street wall. The open space of grass is well proportioned and the whole scene is one which—in its formal, symmetrical style—is not surpassed for effectiveness in all New England. Suitable general design is just as effective in any other conceivable style.

Space forbids further dwelling upon the suburban lot and I must close with a few words about the country seat. All that has been said of the importance of care for the house-scene on the part of the architect, is just as applicable here as in the suburbs. Approach roads may be rightly or wrongly placed, and much depends upon this. The house, if it stands in wild scenery, should either be made to harmonize with the scenery or it should distinctly contrast with surrounding nature. In this latter case it should be given a setting of its own, divided by terrace, wall, or hedge from the scenery around. Within this setting the rarest and strangest specimens may be handsomely and fittingly displayed, even though the neighborhood be extremely wild and rough. On the other hand, if specimen planting generally works mischief in the suburbs, it is absolutely monstrous in a broader landscape. Small or large scenery can be "improved" by one method only: it may be induced to take on more and more of appropriate beauty and character. What nature hints at she may be led to express fully; and, if the genius of the place be continually consulted, there is no scene the natural beauties of which may not be heightened by landscape art.

Discussion.

William C. Strong said that the nature of their business leads nurserymen to recommend the planting of many trees and shrubs,

and there is a great temptation for them to exaggerate the value of new things. In general, those who establish new places are not competent to lay them out, although it is very important to those who invest large sums in building that the surroundings should be in keeping. Doubtless in the future new varieties of trees and shrubs will be introduced and used largely. Hybridization will be more generally practised, and by its means striking varieties will be produced and will be wanted. Gentlemen, as a rule, overplant, as they get catalogues of novelties and want them all, and these produce want of harmony by being out of place. The speaker recommended by all means that in planting new places a competent man should be employed to direct.

Henry Ross did not agree with those who teach that we must not have much color or many foreign shrubs in our grounds. He believes that we want color out-doors as much as we want pictures in our houses; the trouble is that the colors are not arranged with good taste. In forming new grounds men are apt to select too level a place for the house and keep it too level. He would make hills if he could not get them otherwise, but it must be done with good taste; bowlders should not be placed at the fork of a road in grounds where no bowlders exist naturally. He believes in curves, but we must have a good reason for every one. An architect should not be employed and then a landscape gardener, but one man should be competent to build the house and lay out the grounds. The speaker saw a bed of scarlet geraniums at Mr. Sargent's several years ago, in front of a long greenhouse, which were planted in good taste and in connection with the trees and shrubs produced an excellent effect. At the Lyman place there is a large extent of lawn and an avenue of elms forming a Gothic arch; two large clumps of red pæonies near the house gave the place when seen from the street more character than anything else; they added a finish to the whole. The time will come when we shall have more flowers in our grounds than we have now.

John G. Barker thought the paper which had been read a very timely one, and leading in the right direction. He did not agree with the preceding speaker that the same man should plan both house and grounds. If a landscape gardener's bump of adaptability is at all developed, he will adapt the grounds to the house. Many new residences are formed in grounds that are almost

woods, where grass and native shrubs produce beautiful effects. The speaker would use permanent hardy flowering shrubs and herbaceous plants rather than those that last for only one season. Yet beautiful effects can be produced with annuals, as the Garden Committee witnessed in a visit to Hopedale a few years ago, where a lady with only a few hot-bed sashes and a bay window produced surprising results. It is very easy to find out what are the best shrubs, with the advantage of the Arnold Arboretum to study them in. He considers the Arboretum one of the grandest educational places in the United States. A great many hardy trees and plants can be grown for the cost of a flower garden. He thought this subject a very important one, and hoped it would be brought up again.

Warren H. Manning recommended the Junipers as especially desirable. *Juniperus communis* is valuable in many situations, particularly in dry soils, on ledges, and among rocks. But it varies greatly, the vase forms not being as useful in lawn planting as the low trailing variety, which makes an excellent outside plant in a group, bringing the foliage down to the grass better. Most shrubs are more effective in masses than when spotted about, a single plant in a place. It is better, also, that a single variety should predominate, other kinds being introduced sparingly to heighten the general effect or give variety, but always subordinate to the mass.

O. B. Hadwen said the paper was both interesting and instructive. He thought it would be hard to find two persons who would agree perfectly as to the best method of planting home grounds. A group of oaks is always pleasing to him. But he has a great liking for all trees and shrubs, and for that reason it would be difficult for him to lay out and plant an estate. He believes in annuals, and likes grass also near the house, rather than either trees or shrubs. For sanitary reasons he would object to the use of manure for lawns, preferring other fertilizers, such as bone and ashes, near the house.

A vote of thanks to the essayist was unanimously passed for his interesting and valuable paper.

The announcement for the next Saturday was that James J. H. Gregory, of Marblehead, would read a paper upon "The Cultivation of the Onion."

BUSINESS MEETING.

Saturday, March 23, 1889.

An adjourned meeting of the Society was holden at half-past eleven o'clock, the President, Henry P. Walcott, in the Chair.

Benjamin G. Smith announced the decease of Charles L. Flint, formerly Secretary of the State Board of Agriculture, and moved that a committee of three be appointed to prepare a memorial. The motion was carried, and the Chair appointed, as that Committee, Mr. Smith, O. B. Hadwen, and Robert Manning.

Adjourned to Saturday, March 30, 1889.

MEETING FOR DISCUSSION.

The Onion; Its Varieties and Cultivation.

By Hon. James J. H. Gregory, Marblehead.

Owing to the low prices at which onions have been raised in the West, their culture is a sore subject, but in spite of such drawbacks the farmer's occupation is the most independent of all. He can get a living when those of no other occupation can, for he can fall back on mother earth. His business is the only one that admits of barter; to this day we may see in country stores two prices affixed to goods, the cash price and the barter price.

Botanically the onion belongs to the lily family. One difference between it and other plants of the same family is the presence of the dry outer skin on the bulb. The onion is a bulb — in reality a bud; it is not solid like the tuber, which is a thickened stem or root. All the leaves begin at the bulb, which makes its greatest growth while the leaves are dying down, and this seems to confirm the popular saying among farmers that "the top has gone into the bottom." That the onion is a true bulb is shown by the manner in which it starts in the spring—not from all over the top like a beet or a carrot, but with a sprout from the heart at the centre like a cabbage, which is also physiologically a bud, the outer layers wrapping and protecting the germ just as in the case of the buds of a tree.

The native home of the onion is in the mother country of our race and of a very large proportion of the food-yielding plants

that support it — Asia. The Israelites after leaving Egypt remembered with longing the onion among other vegetables which they ate there.

As an article of diet the onion has not occupied the place it deserves; it is generally looked upon here merely as a relish, whereas it is really a nourishing food. I have heard of miners in the West making their dinners of half bread and half onions. Their unpleasant effect on the eyes when peeling them may be avoided by holding them under water while doing it. The peculiar flavor of the onion is due to a volatile oil which is very subtle, and consequently, to be in perfection, it should be eaten as soon as it is taken out of the ground. I have entertained at my farm in Middleton friends who had never eaten onions fresh from the ground and who were surprised at their sweetness. I think that their fine flavor is even more volatile than that of green peas or sweet corn.

There are two distinct classes of onions — those which do and those which do not produce flowers. In the latter class are the potato or "multiplying" onion and the shallot, which, as we all know, are propagated by what are commonly called "setts" — botanically offsets, though occasionally the shallot will make a show of seed. The shallot is the longest keeper of all the onion family; sometimes it will keep for two years, and therefore it fills a place of its own. They are sometimes sold in the market as potato-onion setts. There are two or more varieties of shallot.

Top onions, potato onions, rareripes, Egyptian onions, onion setts, and annual onions, or, as the last are termed in the South, "black seed" onions, to distinguish them from those raised from setts, include all that market farmers and gardeners handle, with the exception of cives, a species which makes but a suggestion of a bulb, the green tops cut for salad being the marketable portion. These cives appear to be natives of this country; it is stated that they grow wild on the shores of Lake Huron and Superior, and the name Onion River would suggest that they have been found there. I think they grow wild also in Marblehead.

As regards soil, onions will grow on any soil from muck meadows to clay loam. They succeed on Marblehead Neck on soil so gravelly that after a rain there will be places a yard square on which not a particle of soil can be seen. Muck soil will not

make a first-class onion without silica added in the form of gravel or sand. Two hundred loads of gravelly, gritty soil should be carted on to an acre; otherwise the onions will be coarse, thick-necked, of bad color, soft and spongy, and poor keepers. In other respects the muck may be treated like upland soils. Muck is very rich in latent nitrogen, and if manure is applied it should be bone and ashes rather than barnyard manure; this remark will apply not only to onions, but to any crop in such soil. Thin, upland soils need humus; muck does not. A gravelly, sandy loam gives onions the strawy color so much desired. Very heavy manuring gives earlier, harder, and thicker bulbs and causes them to ripen all at once. To put in more manure than is really needed makes the crop so much earlier that it pays well.

A weedy soil should be avoided. Old soils add greatly to the expense of raising this crop. There are three weeds which are especially injurious in an onion bed — twitch grass, purslane, and chickweed. In regard to the first, money is saved by taking out every spear before planting. The soil should be lifted lightly with a fork and the grass drawn out. Purslane is a very peculiar weed; it not only produces innumerable seeds, but I have found that every piece into which it is cut in weeding will take root. It is, however, not a tall, smothering weed, and is said to indicate land rich in potash. Chickweed is the worst of all weeds for onions. It washes over the land, and sticks to your boots, and is carried about in that way. If a bed is badly infested it is better to discontinue cultivating onions on it and try new land. Where grass land is broken up the sod should be well rotted by other crops before planting onions; they can be raised the second year from pasture sod and in three years from mowing sod. In pasture lands there are few weeds, and it will warrant a large outlay for beets, onions, and similar crops. As much as seven hundred bushels of onions per acre have been raised on black muck soils without manure. They seem to do better in the West on such soils than here. New York, Ohio, and Iowa are our great competitors in onion growing. Onions will follow carrots, potatoes, or corn kindly, and will follow cabbages and mangel wurzel, which have drawn heavily on the soil for potash, provided an extra dressing of this element is given. Last year I planted a bed, part of which had been in carrots and part in mangel wurzel the year before, giving an extra quantity of

potash to the latter portion, and no difference could be seen in the crop on the two parts. It used to be thought that onions could be raised successfully for many years on the same ground, and General Barrett of Concord, once showed me a piece of ground where they had been raised about ninety years continuously, but now we can get only a few crops off the same piece of ground. A deep, strong soil is best; it should have sufficient moisture and be level or nearly so, else the wash of the land will cover the young plants.

As to varieties the European catalogues describe thirty or more, which I have imported and tested, with the result that there were only two or three of decent quality among them, the great majority not being adapted to our climate. The Danvers is mostly cultivated in New England. The Connecticut farmers have run this variety thinner than it is grown here. The Cracker is earlier and of fine quality, and will grow farther north than any other. The Southport White Globe is very handsome, but requires great care in curing not to become green; after being pulled they should be piled in heaps of two or three bushels each and covered up or placed in airy dark buildings six inches deep. The White Pearl and New Queen are very nice for early bunching; they come along about as early as those raised from setts. In Connecticut the Red, White, and Yellow Southport are favorite varieties. The Top onion is sometimes planted in August for May marketing. The Egyptian belongs to a distinct class; it is of irregular form, is planted in September, and starts early in the spring — earlier than the weeds. They have to be planted but once. Onion seed raised here is much better than foreign; only about fifty per cent of the latter will grow. Setts may be planted about the middle of May, three inches apart; they require very rich manuring.

In preparing the ground for onions, I recommend the use of a gang plough, and Meeker harrow which does the work of raking in half the time required to do it by hand; the competition is such that we must economize in every possible way. With the Monarch pulverizer and Meeker harrow I have prepared three and a half acres in four hours. The Meeker harrow consists of four series of wheels, and will do the work of eighteen men; it makes the ground as fine as raking, but does not press down stones of any size.

As to manures, onions are great feeders and like something to select from. I advise applying at least ten cords of barnyard manure per acre, or its equivalent; farmers in the vicinity of Boston use twenty cords of stable manure. But I think it better to use half the quantity of manure, and the other half in commercial fertilizers, or, cheaper yet, to use all fertilizer. The latter can be applied at any period of growth, but there is danger from using a phosphate continuously. In Bermuda, the onion growers use part sea manure and part commercial fertilizers. One of my neighbors uses ten cords of a mixture of barnyard manure, sea manure, and night-soil, a very concentrated manure, probably equal to double the quantity of ordinary barnyard manure. I recommend the application of three hundred pounds of nitrate of soda per acre just as the crop begins to bottom; or, if the crop looks feeble, a complete fertilizer may be used. In all farming a good deal of manure seems to be misapplied, and I suggest the use of less manure and more of commercial fertilizer.

In a crop of 700 bushels of onions there will be 58 lbs. of potash and 53 lbs. of phosphoric acid. A cord of average stable manure, weighing 4,500 lbs., will contain 18 lbs. of potash and 22 lbs. of phosphoric acid, and 20 cords would contain 360 lbs. of the former and 440 of the latter. If this quantity of manure is applied every year for twenty-five years we shall have put into the soil 9,000 lbs. of potash and 11,000 lbs. of phosphoric acid. But the crop during this time will have contained only 1,450 lbs. of the former and 1,325 of the latter, leaving in the soil an excess of 7,550 lbs. of potash and 9,675 lbs. of phosphoric acid. These substances will, if the land is ploughed eight inches deep, be distributed through 227 cords of soil per acre, which would give an average of 33 lbs. potash and 42 lbs. phosphoric acid per cord, so that the whole soil would average more than half again as rich in potash as average barn manure (that is, in the proportion of 33 to 18), and nearly twice as rich in phosphoric acid (in the proportion of 42 to 22). This soil itself would have become manure, and as a dressing for grass land would be worth half as much again as barn manure. On such land I suggest using no barn manure, and nitrogen only in forms that will meet the wants of the crop as it comes along. This should be done two or three times during its growth.

There are three classes of seed-sowers — the finger-stirrers,

force-feeders, and agitators. I prefer the first two. There is one that plants two rows at a time. Two men will produce very different results with the same machine or with seed from the same bag. In Connecticut the seed is sometimes dropped in bunches alternating with carrots; the carrots then have an opportunity to make a late growth. From three and a half to eight pounds of seed is sown on an acre; four pounds is about the usual quantity, but four and a half or five pounds may be used on new soil, and from five to six pounds on very rich soil. It is important to plant early; certainly before the close of the first week in May. The rows should be from twelve to eighteen inches apart. If there are any blank spaces they should not be filled in with tomatoes, cabbages, or other large-growing plants, as these grow to shade more of the crop than they are worth.

As to weeding, I would say — Be sure to weed just as soon as a row can be seen. It is a good plan to sow radish seed with the onions, that the rows may be distinguished more plainly. If two or three rainy days come, this means an extra weeding. I have tested twelve different sorts of weeders and like the horizontal best for use when the onions are small. One kind, which I think well of, weeds two rows at a time. There is one, called the finger-weeder, which gives the operator very complete control over his work. With a sliding weeder there is danger of cutting or bruising the bulbs. It is an excellent plan to double-slide them as we go along, first close to one row and then close to the other. They should be weeded from five to seven times during the season.

For the onion maggot, I have found hens and chickens a possible remedy. A hen and brood of chickens will take care of from an acre to an acre and a half.

In harvesting green onions should not be mixed with dry ones. When most of the tops are down there is danger of their re-rooting. In Connecticut they are harvested earlier than here. On highly manured land they will be ready to harvest earlier than on land not so much enriched. A cultivator with a scraper attached is a good thing to clean the bed with. I freeze a part of my crop, piling them fifteen inches deep and from fifteen inches to two feet from the wall of the building, the space between the wall and the onions being filled with hay; they are then covered two

feet deep with hay. They must not be touched or handled while frozen. For marketing they should be evenly assorted; many small ones cause extra loss in price.

On concluding his lecture, Mr. Gregory asked whether any one present had had experience in planting onion seed in the fall.

Discussion.

William D. Philbrick, replying to Mr. Gregory's call for experience in fall sowing of onion seed, said that he had sown in August but did not succeed. A neighbor, the late Timothy Corey, of Brookline, followed the plan successfully, sowing about the 20th of July. When the ground began to freeze the plants would be about a foot high; they were then covered with strawy horse manure which was raked off the first thing in spring. In this way he got bunch onions the 20th of May; he succeeded about three years out of five.

Mr. Gregory in reply to a question said that the very large Spanish onions seen in the market, when cultivated here give only a few good ones.

Benjamin P. Ware said that in the West farmers plough up prairie land and sow onion seed broadcast and get a great crop without cultivation. This seems discouraging to us, but they are still considered a profitable crop here. The onion maggot has given him so much trouble that he does not grow as many onions as he used to. Mr. Gregory had shown that great manuring is useless; the speaker thought that eight cords of manure such as he uses — the manure of cows and horses, with the addition of sea manure — would furnish all the food needed; it is much better than stable manure from Boston, where the most valuable part — that is the liquid part, runs into the sewer and is wasted. The lecturer had had great experience with implements, but there is one — the drag, which Mr. Ware regards as of very great value, that he did not mention. The speaker exhibited a model of this implement, which he thought would do better work than the Meeker harrow in pulverizing the ground for small seeds. It is eight feet long and four feet wide, made of two-inch plank, with a hard-wood cleat three inches wide and an inch thick on the bottom. The planks are nailed firmly to two pieces of timber, one end of each piece of timber being cut at such an angle that the plank nailed to it is slightly inclined, so as to be

drawn over the ground more easily. The cleat is nailed to the middle of the flat part. It is drawn by two horses after the ground has been thoroughly harrowed, and crowds down the stones and grinds up any lumps of earth. It may be driven round the ground or back and forth. In using the drag the driver stands on it. It is useful in laying fields down to grass, the seed of which is the finest of any we sow. Labor is the great expense in farming, and the more we can save the better we can compete with those more favorably situated. We have got to manage better and be sharper than before we were subjected to such competition. A brush harrow would be better on top-dressed land than the drag. The latter needs the weight of the driver; it carries a little wave of earth in front and fills up the horse tracks.

Mr. Philbrick said that he made a drag to use in preparing market garden beds, but did not like it as well as hand raking, which carries the lumps of earth into the furrows.

Mr. Ware had found that the drag would not do good work on wet land.

Mr. Philbrick said that market garden land must be ploughed early.

Mr. Ware responded that he would not work land until it is dry enough to be friable. Raking the land requires experienced men to make the ground even.

Mr. Gregory remarked that the Meeker harrow should be used two ways, first in the direction the rows of onions are to extend, and the second harrowing crosswise of the first.

O. B. Hadwen moved a vote of thanks to the essayist for his instructive and interesting address, which was unanimously carried. He also, as Chairman of the Committee on Publication and Discussion, announced that the meeting on the next Saturday, would be the last of the series for the present season, and would be devoted to short papers and discussions on such subjects relating to horticulture as might be presented or suggested, and any one would have the opportunity to bring up any subject that the Committee had overlooked.

BUSINESS MEETING.

SATURDAY, March 30, 1889.

An adjourned meeting of the Society was holden at half-past eleven o'clock, the President, Henry P. Walcott, in the chair.

Benjamin G. Smith, Chairman of the Committee appointed at the last meeting to prepare a memorial of the late Charles L. Flint, reported the following:

Charles Louis Flint, son of Jeremiah Flint, a farmer, was born in the town of Middleton, Massachusetts, May 8th, 1824. His early life, like that of most farmers' boys, was divided between labor on the farm and study in the country school. But in this quiet country life influences were at work which gave this young farmer-boy an intense desire for study, and a determination to acquire a thorough education. By his indomitable perseverance, unaided by others, he surmounted every obstacle and secured a thorough academic, collegiate, and legal education at Cambridge. He resolved not to graduate wholly without honor or distinction as a writer; he determined to compete for one of the Bowdoin Prizes, and, although engaged in teaching at the time and having the strongest competitors the class could offer, he won the first prize.

The Boylston Prizes for declamation were also open to him on graduating, and he determined to try his fortune as a speaker. In this contest he carried off the second prize. He had previously taken the first prize for Latin hexameters and pentameters, on the first institution of those prizes in 1848.

At his graduation from the Cambridge Law School he received an invitation to enter the office of a lawyer in extensive practice in New York City; this he accepted, and he was admitted to the New York bar, of which he was a member at his decease. At this time he was a frequent contributor to the "Journal of Agriculture," a monthly publication in Boston, and some of his articles were extensively copied and republished in agricultural periodicals both in this country and in Europe.

The Massachusetts Board of Agriculture was organized in 1852, and the selection of a competent secretary was a subject of anxious concern to all interested in the enterprise. It was seen that the efficiency of the Board in promoting the important interest for

which it was established, would in a great measure depend upon the scientific and administrative ability of the Secretary. Through urgent solicitation by Ex-Governor Everett, Hon. Marshall P. Wilder, and others, Mr. Flint was induced to relinquish his law connection in New York, and accept the Secretaryship of the Massachusetts Board of Agriculture at its organization, and for twenty-seven years he discharged the duties of the office — how well, all know who have read the annual reports for that period, and have taken interest in the advancement of the industry upon which all other material interests depend.

Mr. Flint, by his integrity, industry, superior education, and good judgment, was successful in everything in which he engaged. He acquired an ample competency, and was ready at all times to contribute freely wherever he thought the object was deserving, and especially to promote the interests of Agriculture, Horticulture, and Pomology.

The Committee therefore recommend the passage of the following resolutions.

Resolved, That the members of the Massachusetts Horticultural Society greatly deplore the loss of their associate, who by his eminent services has done so much to advance and extend a taste for the kindred arts of Agriculture and Horticulture.

Resolved, That in the death of the late Charles Louis Flint, Agricultural and Pomological science have sustained a great loss,— distinguished alike for his private worth and public usefulness, his memory will be cherished and his decease sincerely lamented.

Resolved, That while we deplore the loss of Mr. Flint we rejoice that his example will still live; that his printed works will still speak to us, and that his influence in promoting rural art and rural taste will continue to bless those who survive him.

Resolved, That we sincerely condole with his bereaved family upon this afflictive dispensation of an inscrutable Providence, and that as a manifestation of our respect and sympathy the Secretary be directed to transmit to them a copy of the foregoing resolutions.

BENJAMIN G. SMITH,
O. B. HADWEN,
ROBERT MANNING,
} *Committee.*

Boston, March 30, 1889.

Leverett M. Chase said Mr. Flint was his friend, and when the death of that friend was announced his first feeling was that of personal bereavement. There was never a firmer or a stauncher friend. He knew Mr. Flint as a boy. His tastes were inherited and were developed by the farmer life of his early years. When he was teaching in Cambridge he became deeply interested in the cause of education. He was one of the first and most active persons in the movement to establish the Massachusetts Agricultural College, and later on was as ardent a worker in the founding of the Massachusetts Institute of Technology. As a member of the School Committee of the city of Boston, his lively interest in the higher education of our youth caused him to be placed upon the Sub-Committee on the English High School and the Public Latin School. He also took a great interest in the erection of the present building for those schools. He was also on the Sub-Committee in Mr. Chase's own district. Mr. Flint was free from everything that could look like a job; he would not accept carriage hire as a perquisite, although the state of his health, enfeebled by hard study while at Andover from which he never recovered, made riding necessary in the discharge of his official duties. He had a very strong sense of duty and felt bound never to think himself too feeble to respond to just calls upon his time and services. He is now resting from those labors here; but we believe his spirit is still active and loving in his home above, and free from any sense of weariness and thought of unrequited toil.

William C. Strong was very glad to hear this just tribute to the character of Mr. Flint. He was sufficiently acquainted with him to know that he was an able, true-hearted, and earnest man, who had done good service to the cause of Agriculture, and though he had not taken an active part in the affairs of this Society, yet his sympathy and warm interest had always been with us, and the consciousness of it had given us strength.

O. B. Hadwen said it was his good fortune to be associated with Mr. Flint in several ways, and especially in the Massachusetts Board of Agriculture. There was much hard work to be done by the Secretary of the Board, to effect the organization of the department upon a basis so well planned as to secure permanence. For this duty Mr. Flint was found to be peculiarly well qualified, as he was also to formulate and carry on the business of that department, which he did with great success during a period of twenty-

seven years. He was also Secretary of the Board of Trustees of the Massachusetts Agricultural College for a long time, and when President William S. Clark resigned his position, Mr. Flint was called upon to assume those official duties until a permanent president could be found. He always had an ardent desire to promote the education of young men in the higher branches of agricultural science, and during the year that he held the presidency his enthusiasm exerted a strong influence in advancing the interests of that cause. All his duties in connection with the college were faithfully and efficiently performed, in addition to his regular work as Secretary of the Board of Agriculture. The death of Hon. Marshall P. Wilder made vacant the office of President of the Massachusetts Agricultural Club, and Mr. Flint was at once elected to that office, which he continued to hold while he lived. Of the members of this Society the speaker was the last one to see Mr. Flint.

Benjamin P. Ware said he also was thoroughly acquainted with Mr. Flint, who was a native as well as a resident of Essex County in early life. The story of his life was one of the most remarkable as showing how little we know of the duties in life which are waiting for us. Mr. Flint once said to him that the prizes he had won helped him very greatly; that on one occasion, while waiting in the railroad depot at Salem, he saw the advertisement of a prize of twenty dollars for the best essay upon "Indian Corn," offered by the Essex Agricultural Society. After some consideration of the matter he decided to try his power to win that prize. He went to Cambridge to make some studies for the work. While so doing he became deeply interested in the historical view of his subject, and in his essay he presented a thorough and exhaustive history of Indian Corn from its introduction among civilized people. It won the prize; but that was not all. It attracted the attention of Hon. Marshall P. Wilder, who had also read and appreciated other writings of Mr. Flint upon agricultural topics. Col. Wilder was then interested in making the projected State Board of Agriculture a successful and permanent institution. He believed that result depended largely upon the person who was selected as its Secretary,—that whoever it might be must organize and establish the department. The character and quality of Mr. Flint's essays convinced Col. Wilder that the writer was the person who should be secured for that secretaryship. His associates

coincided with him and Mr. Flint was persuaded to give up his situation in a law office in New York, come to Boston, and take hold of the work, and we know how well he fulfilled the anticipations of those who called him to it. Thus it would appear that his course was marked out by other forces than his own desires. His failing health prompted him to seek relief and benefit from the more genial climate of Georgia, as in previous seasons of prostration. He started south with Mr. Hadwen, but, as it proved, he was ill prepared to bear the fatigue of such a journey, and his course was finished in one week after his arrival at Hillman, Georgia. Mr. Ware gave his hearty approval to the resolutions which so fittingly expressed the sentiments of all the members of the Society.

The memorial was unanimously adopted.

The President gave notice that the meeting on the next Saturday, April 6th, would be a regular stated meeting for business, and would be held at eleven o'clock, A. M.

The meeting was then dissolved.

MEETING FOR DISCUSSION.

No special subject was assigned for the meeting for discussion today, but it was devoted to such general subjects relating to horticulture as might be suggested. The President remarked that on so wintry a day it would be agreeable to have a whiff of the tropics, and called on the delegates to the meeting of the American Pomological Society at Ocala, Florida, in February, for a report of their visit.

William C. Strong, Vice President for Massachusetts of the American Pomological Society, said that the delegation from this State was larger than that from any other Northern State. The greater part of those who attended were from Florida; probably there were a hundred, mainly Northern men who had settled in Florida. All that part of the State south of Jacksonville is well under Northern influence, and all south of Palatka has been born within fifteen years. In the northern part of the State there are old settlements, built up by cotton, but south of Palatka all is new. Ocala, where the meeting was held, is a typical town of the new order, a hundred miles south of Jacksonville, and fifty miles southwest of Palatka. It is in a region a little undulating, there being hills

from fifty to sixty feet above the sea level. There is very little land much above the ocean, and east of the St. John's River it is very low. In going from Jacksonville to Ocala they rode on a dead level through a very uninteresting country. Most of the orange culture is west of the river, and all were surprised to see how quickly it has grown up. At Ocala there is a wide avenue leading three-quarters of a mile to the building of the Florida International and Sub-Tropical Exposition, which had been tendered for the use of the Pomological Society. This building had been put up within sixty days, in a pine wood, and there were several tall pine trees growing inside. The exhibition of oranges and other fruits of the citrus family was marvellous, the specimens varying in size from oranges no larger than walnuts to the enormous shaddocks. There were a hundred and fifty varieties of oranges, but it was difficult for an untrained eye to perceive any difference between some of them. The shaddock is regarded as of no value, but the grape-fruit or pomelo, which resembles it in outward appearance but grows in clusters, is preferred to the orange for eating before breakfast with sugar. The oranges are full of juice, with very little pulp.

The delegates were surprised to find that such able men had gone there and been fascinated with orange culture; also that their numbers are increasing immensely. The papers on the culture of the sub-tropical and tropical fruits read at the convention evinced surprising ability; they were admirable essays on the culture of the orange, pineapple, banana, etc. Some wholly tropical fruits can be cultivated in the lower parts of the State. Our markets will probably be flooded with oranges from Florida. The Harris grove consists of a hundred and eighty acres; the owner went there not twenty years ago, with less than fifty dollars, and this year of low prices his crop sold for $60,000. This is what is called a natural grove, consisting of wild trees grafted; the trees were consequently not in rows, but growing irregularly. Generally the soil is very sandy, but here there is much humus in it. The trees were thirty feet high, interlocking though thinned out, and it was very easy to lose one's self in this forest. The party of a hundred persons got separated there. The sight was one of which we should not have credited the story. Half the crop was unharvested, and while the party were there ladders were run up the trees, and two or three thousand oranges were brought down. The trees

were surprisingly beautiful, and with the gray ground and green foliage and golden fruit, made a charming sight. Tramways are laid through the groves, on which mules draw the fruit to the packing houses. Adjoining this grove was another, making the whole extent on the river five miles. Most groves are not yet in full bearing. There is a "boom" in fruit culture, and much Northern capital will rush in and the business will be overdone and some will lose. Transportation to market is the only problem; the oranges can be raised for fifty cents a box gathered from the tree, but not including packing. One grower said that if he could be insured fifty cents per box for the fruit he would retire from all labor.

The Deland grove was established by a gentleman of that name who heard a paper on orange culture read at the meeting of the American Pomological Society at Chicago in 1875, and was thereby induced to go to Florida and purchase and prepare land and plant a grove. This grove of one hundred and fifty acres was afterwards sold to Mr. Stetson of Philadelphia. The older portions are more regular than any apple orchard in New England. The trees are as round and symmetrical as if made by machinery, and form as beautiful a sight as can be conceived. Trees whose form has been marred afterwards regain their symmetry. They will not bear neglect but if necessary must be fertilized, especially on pine land. Low hummock land is never fertilized.

The speaker was surprised to find how rapidly the trees grow; he saw shoots six feet long and rank; they make three separate growths annually,—an early, middle, and late. They would come into bearing in less time than the earliest bearing pear trees; in fifteen years they would be in fuller bearing than even Bartlett pear trees. The anxiety about freezing is unnecessary except in the northern regions; the frost six years ago has not been repeated, and as the trees get older they afford mutual protection.

The groves are cultivated by running a light cultivator or Acme harrow through, though this could not be done in an irregular natural grove like the Harris Grove. Many seedlings spring up in the groves, which are carefully dug up and planted in nurseries to be grafted.

The orange is not indigenous in Florida, and was not largely planted until within a few years; it was planted to some extent by the Indians. The Harris grove indicates that it is entirely at home there. In this grove are live oak trees, some of which are

of immense size; one measured thirteen feet in diameter. Cypress trees grow on the hummock ground.

O. B. Hadwen said that in going south they had an opportunity to notice the difference in the parts of the country they passed through. South of Washington they found a region of corn and sweet potatoes. Next came tobacco, with large buildings for curing it. Then came cotton, but apparently not cultivated under the most favorable circumstances; the land seemed to lack fertility. A great change was noticed in the forest trees; tulip trees and species of oaks that we do not have here were observed, while the same species of maples continued. Before reaching South Carolina they noticed the *Magnolia grandiflora*. In Augusta, Ga., they saw fine specimens, probably a hundred years old. There were two varieties of live oak. After leaving Jacksonville the orange groves were very striking. The exhibition was exceedingly interesting, showing the products of the whole State. Fine oranges were displayed in profusion, and the characteristics of the different varieties were discussed as we discuss those of apples. Mr. Hadwen said his eye was not yet educated to pick out fifty different varieties, and he doubted whether those of the growers were. He discovered slight differences, but some varieties could only be distinguished by cutting the fruit open. The varieties are largely determined by the flavor and the size. He did not have an opportunity to study the growth of the trees. Besides the remarkable exhibition of citrus fruits, such as the orange, lemon, etc., the guava and other sub-tropical fruits were shown. The bananas did not appear to be in a climate that favored them, but looked as if they wanted to be farther south.

The forest trees were very striking; the live oaks were wonderful. So also were the long-leaved pines, which furnish the yellow pine timber, especially in their earlier stages; they run up like a candle, as large at forty feet high as at the base. The deciduous cypress grows in swamps and low ground; the timber is very beautiful and very durable, so that it is said that shingles made from it will last forever. The palmettos are marvellous; the stems are quite rough when young, but when eighty feet high they are very smooth. The bud is used as a salad, and is perfectly delicious.

Benjamin P. Ware said that one point had not been mentioned by the previous speakers — the peculiar formation of the lakes and springs; a spring there means a river coming out of the

ground from fifty to a hundred feet wide. Silver Spring affords steamboat transportation for ten miles before it flows into a river which empties into the St. John's, but he took a small boat because he could see the river bottom better. The water is so clear that where it is eighty feet deep the sand at the bottom looks as if it were within a foot of the surface. He could see little fishes near the bottom and their shadows on the bottom. The formation is coral, and in one place the water pours out from under a coral shelf; in another spring there is a hole six feet in diameter in the bottom, through which the water pours up. The central part of the State is made up of a chain of lakes, forming the St. John's River, which in some places is very wide and in some very narrow. At Blue Spring a portion of the surface had a beautiful blue color, and another was of a most brilliant green, like the colors of a peacock. The bank was fifty feet high, and the view from it was magnificent. A hunter, engaged in killing birds to decorate ladies' bonnets, told the speaker that he had also killed two hundred alligators this season; the skins bring from sixty to ninety cents each. While the alligators may be exterminated in some places, there are thousands of acres that will remain in swamps and be the home of alligators for all time.

There are no statistics in regard to the acreage of the orange crop in Florida and no way of foretelling the future product. The crop this year is estimated at three million boxes — about half the consumption of this country. There are not less than four hundred thousand acres devoted to oranges today, but many thousands of acres will never produce oranges, for they are not successful unless cared for. But the increase must be immense, for not more than one acre in thirty is in full development. The growers are endeavoring to get a tariff on foreign fruit of one dollar per box. The great want is cheap transportation to the consumer.

The speaker thought it would have been better if some of the capital which has built a surplus of railroads in the West had been devoted to building them in Florida. The roads will probably hereafter centre in some port where steamships can take the oranges to Northern cities. The growers are learning to load them in cars in bulk so as to be transported safely. The price will probably diminish until they are sold here for half what they cost today, which will bring about additional consumption as we learn to eat more. Oranges are enormously productive; Mr.

Ware saw twenty-five on a stem not larger than his little finger; the buds which he saw are now in full bloom. At Mr. Phelps's place he went up to the top of the house, from which he saw two hundred acres or more of oranges, and beautiful lakes. He also saw here a plant of the Cherokee rose, sixty feet in diameter and twelve feet high. The plant was a mass of foliage; the flowers, which are large, pure white, and single, were not yet open, but it was covered with buds.

Benjamin G. Smith spoke warmly of the hospitality which the pomologists received everywhere. They went under the most favorable auspices, and had the freedom of all the railroads in Florida. Their trains were run into orange groves, and waited for them to inspect the estates and test the productions. They were invited to numerous receptions. As a memento of this visit to Florida, he brought home an orange shoot eight feet and three inches in length, and which had been three feet longer, but that amount was cut off. Although it was but one season's growth, it was an inch and a quarter in diameter at the butt, and three-quarters of an inch at eight feet from the butt.

Mr. Strong said that the development of Florida was all owing to the railroads, which had been built beyond the demands of the country. On such level ground, with the aid of the land grants which have been given them, they could be built at a nominal cost and they have spread over an immense territory. But the whole had not been told — the sugar industry is going to exceed all others. He saw one plant which promised wonderful results, surpassing Louisiana, for the cane escapes frost and the manufacture of sugar is not confined to a few weeks, as in Louisiana.

Robert Manning spoke of a visit to Florida with the late Hon. Marshall P. Wilder and other horticulturists twenty years ago, and of the soil, apparently consisting only of sand, which had been mentioned by previous speakers. As Colonel Wilder and he were walking in the street in Jacksonville they met a man who had come from Hudson, Mass., to prospect for some of his townsmen who were thinking of settling in Florida. He began at the western part of the State and came east to Jacksonville, and remarked in a dry way, "I haven't seen any land in Florida yet but what looked as if it would want to be manured about once in twenty-four hours." And truly it did look so to a Northern eye; but the late Solon Robinson, well known as an agricultural writer, who then lived at Jacksonville, informed the party that he had

seen rank weeds growing in this apparently barren sand which had been thrown up from a depth of eight or ten feet. The party went from Charleston to Savannah in a little steamer, through the Sea Island channels, where, in the month of January, the oranges were hanging on the trees so near that they seemed as if they could almost be reached from the boat.

President Walcott suggested that, as this was the last of the series of meetings for discussion the present season, some acknowledgement should be made to the Committee who had so successfully provided papers and speakers. A vote of thanks to the Committee for their efficiency was accordingly moved.

Rev. A. B. Muzzey said that the meeting ought not to separate without some recognition of the valuable services which the Committee on Publication and Discussion had rendered to the Society. The programme of the meetings comprised a great variety of subjects, and there was not one that was not interesting and instructive. One of the essayists had taken us abroad and given us information in regard to foreign horticulture. The speaker regarded the Massachusetts Horticultural Society as the foremost of all such societies in this country; its motto is "growth" — one of the most inspiring words in the English language. Whatever we may have done we have power to advance upon it, and we are likely to do far better in the future. Mr. Muzzey thought that these meetings showed progress in the power of extemporaneous discussion on the part of the members of the Society and others who have united with them. There seems to be something in horticultural pursuits especially favorable to intellectual growth. We have only to go on with such progress in the future as we have made in the past to effect the object for which the Society exists.

The vote of thanks to the Committee on Publication and Discussion was then unanimously passed.

Leverett M. Chase spoke of the importance of increasing the membership of the Society. He thought that it might easily be enlarged by a thousand if the members would take hold in earnest. Within a year he had proposed twenty members. The Society ought to have a membership of two thousand.

The meeting was then dissolved.

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Experiment Station Reports Wanted.

The Massachusetts Horticultural Society is endeavoring to collect complete sets of the Bulletins and other publications of all the Agricultural Experiment Stations in the United States and Canada. Those named below are wanting, and any person having a spare copy will confer a favor by addressing the Librarian of the Society, Horticultural Hall, Boston.

A considerable number of duplicates are on hand, which will be exchanged for any of those in which the Society is deficient.

Alabama (Ag. and Mech. College Station).— All Bulletins of First Series.

Arkansas.— Bulletins 1, 4, and 11. First Annual Report.

California. — Bulletins, 1, 2, 3, 5, 50, 66, 68. Annual Reports for 1877 and 1882.

Colorado.— Bulletin 3.

Connecticut (New Haven Station).— Bulletins 1 to 67, inclusive. Annual Reports for 1877 to 1883, inclusive.

Georgia.— First Annual Report.

Indiana (Purdue Univ. School of Ag.). — Bulletin 1. College Reports 1 to 14 inclussive.

Kentucky.— Bulletins 8 and 10. All Annual Reports.

Louisiana.— First Annual Report.

Maine.— Bulletins 1 to 20, inclusive. All Annual Reports previous to 1886-7.

Michigan.— Bulletin 3.

Minnesota.—All Reports previous to the Biennial Report for 1887 and 1888.

Missouri.— Bulletins 9, 13, 15, 16, 17, 19, 20, 22, 25 to 31, and 33, of Old Series. Second Annual Report.

Nevada.— First Annual Report.

New Hampshire.— Second Annual Report.

New Jersey.— Bulletins 1 to 34, inclusive.

New York. (State Station).— All Bulletins of Old Series.

North Carolina.— Bulletins 1 to 56, inclusive. Second to Ninth Annual Reports, inclusive.

Ohio.— All Bulletins of First Series.

South Carolina.—All Bulletins of Old Series.

Texas.—First Annual Report.

Vermont.— Bulletin 3.

Virginia.— Bulletin 1. All Annual Reports.

Wisconsin.— Bulletin 2.

Ontario Ag. College, Experimental Farm.— Bulletins 2, 3, 18, and 47. 1st, 2d, and 12th Annual Reports.

Ottawa, Ont., Central Experimental Farm.—All Annual Reports previous to that for 1888. Also, Dairy Bulletin 3.

Toronto, Ont., Bureau of Industries.— Bulletins 1 to 21, inclusive.

TRANSACTIONS

OF THE

Massachusetts Horticultural Society,

FOR THE YEAR 1889.

PART II.

BOSTON:
PRINTED FOR THE SOCIETY.
1891.

☞ SEE LAST PAGE OF COVER.

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TRANSACTIONS

OF THE

Massachusetts Horticultural Society.

BUSINESS MEETING.

SATURDAY, April 6, 1889.

A duly notified stated meeting of the Society was holden at 11 o'clock, the President, HENRY P. WALCOTT, in the chair.

The report of the Committee appointed at the meeting on the 12th of January, to consider the suggestions made by the President in his annual address, was read, and it was

Voted, That the report of the Committee be printed, together with such alterations in the Constitution and By-Laws as its adoption will involve, and that a copy be sent to every member of the Society.

The President, as Chairman of the Executive Committee, reported approval of the following appropriations:

For the Committee on repairs and alterations in the building, a sum not exceeding $500, to be expended in the preparation of plans and printing.

For the same Committee the sum of $12,000, to carry out the recommendations in their report, with the provision that the Library be relieved by the construction of a gallery within the Library Room.

For the Finance Committee, so much of the money received from the insurance companies on account of damage to portraits as is necessary to cover the expense of restoring the portraits.

On motion of Ex-President James F. C. Hyde, these appropriations were unanimously confirmed.

The amendments to the Constitution and By-Laws, which received a majority vote on the first Saturday in January, came up for final action.

The first of these amendments, viz: That Section XXXIII be restored by striking out the words: "Prizes may be awarded to any member of the Society and," and substituting the words, "Prizes or," so that the Section shall commence, "Prizes or gratuities may be awarded to any person," was declared by the President to have received the votes in the affirmative of two-thirds of the members present, and to be adopted as a part of the Constitution and By-Laws.

The amendment to Section I, concerning the election and eligibility of officers, was declared by the President, not to have received the votes of two-thirds of the members present and not to be adopted.

The amendment to Section XVIII, concerning the control of the Library Room, was declared by the President not to have received the votes of two-thirds of the members present, and not to be adopted.

The sum of $50 was appropriated for the use of the Committee on Window Gardening, in addition to the amount previously appropriated.

The following named persons, having been recommended by the Executive Committee for election as members of the Society, were on ballot duly elected.

Henry S. Lawrence, of Roxbury.
Harry S. Rand, of North Cambridge.

The following named persons were, on recommendation of the Executive Committee, elected Corresponding Members of the Society.

Dr. F. M. Hexamer, Editor of the American Agriculturist, New Rochelle, N. Y.

Professor L. H. Bailey, Jr., Cornell University, Ithaca, N. Y.

Professor William R. Lazenby, Secretary of the Agricultural Experiment Station, Columbus, Ohio.

Charles E. Bessey, Ph. D., Industrial College of the University of Nebraska, Lincoln.

Charles A. Goessmann, Ph. D., Director of the Agricultural Experiment Station, Amherst, Mass.

Sereno Watson, Ph. D., Cambridge, Mass.

William G. Farlow, M. D., Professor of Cryptogamic Botany, Harvard University, Cambridge, Mass.

Henry Shaw, St. Louis, Missouri.

William A. Stiles, Editor of "Garden and Forest," Deckertown, N. J.

Dr. T. G. Richardson, University of Louisiana, New Orleans, Louisiana.

Dr. George King, Superintendent of the Royal Botanic Garden, Calcutta.

Dr. M. Treub, Director of the Botanic Garden, Buitenzorg, Java.

Dr. P. MacOwan, Director of the Botanic Garden, Cape Town, Africa.

J. Host, Superintendent of the Botanic Garden, Trinidad.

George Nicholson, Curator of the Royal Botanic Gardens, Kew, England.

Adjourned to Saturday, May 4, 1889.

BUSINESS MEETING.

Saturday, May 4, 1889.

An adjourned meeting of the Society was holden at 11 o'clock, the President, Henry P. Walcott, in the chair.

The President, as Chairman of the Executive Committee, reported approval of the appropriation of $50, voted at the Stated Meeting of the Society, April 6, for the use of the Committee on Window Gardening, for printing and other incidental expenses, in addition to the amount already expended by said Committee for these purposes, and also in addition to the amount of one hundred and fifty dollars previously appropriated for prizes for the year 1889.

The Report of the Committee on Publication and Discussion, for the year 1888, was read by O. B. Hadwen, the Chairman, accepted, and referred back to the same Committee for publication.

The President, as Chairman of the Committee on Repairs and Alterations in the building, presented plans and specifications for increased accommodations for the Library. After examination and discussion of the plans by the members present, it was

Voted, That, the whole subject of increased accommodation for the Library be referred back to the same Committee with full powers, and that, for the consideration of this subject, the Chairman of the Library Committee be added to the Committee on Repairs and Alterations.

Benjamin G. Smith, Chairman of the Committee to prepare a memorial of the late Charles L. Flint, read a letter from Charles L. Flint, Jr., expressing, in behalf of the family, their appreciation of the kindness and sympathy shown by this Society in the resolutions passed in regard to the decease of their father.

Mr. Smith also announced the decease of Aaron D. Weld, one of the earliest members of the Society, and moved the appointment of a committee to prepare a suitable memorial. The motion was carried and the Chair appointed as that Committee, Mr. Smith, O. B. Hadwen, and Robert Manning.

The following named persons, having been recommended by the Executive Committee, were on ballot duly elected members of the Society.

Hugh Nawn, of Roxbury.
Col. Oliver W. Peabody, of Milton.
Miss Katherine W. Huston, of Roxbury.
Miss Mary N. Plumer, of Salem.
Edwin P. Seaver, LL. D., of Newton Highlands.
Washington G. Benedict, of Boston.
Rev. Samuel D. Smith, of Auburndale.
Charles A. Kidder, of Boston.
Mrs. Anna E. Arnold, of Newton.
Herbert H. D. Pierce, of Cambridge.

Adjourned to Saturday June 1, 1889.

BUSINESS MEETING.

SATURDAY, June 1, 1889.

An adjourned meeting of the Society was holden at 11 o'clock, the President, HENRY P. WALCOTT, in the chair.

It was voted that the appropriations hitherto made for the use of the Window Gardening Committee be placed in the hands of the Committee without restriction.

Benjamin G. Smith, Chairman of the Committee appointed at the last meeting to prepare a memorial of the late Aaron D. Weld, reported the following:

Aaron Davis Weld was an honored and respected member of this Society from the year of its formation, having been elected December 5, 1829. He was also a member, for forty-nine years, of the Massachusetts Agricultural Club, and the last of the original members. He was for more than half a century the friend of and co-worker with the Hon. Marshall P. Wilder in promoting agricultural and horticultural interests. His fondness for the country, where he lived for so many years, was a healthful element in his character. None who ever met him could fail to be impressed by his genial disposition. All who knew him will remember the urbanity of his manner and the pleasant tones of his voice, and will sorrow that they shall enjoy them no more. He was one of the old time merchants of Boston, — of whom there are now very few left, — whose enterprise, probity, and public spirit reflected honor on their calling, and who have furnished worthy examples for their successors. He was just and charitable in his judgment of others, and in his domestic relations was an example of all that was kind, tender, and affectionate. He had long been favorably known in the city as an upright and worthy man, illustrating in his life the distinguishing principles of the New England character.

Resolved, That in the decease of Mr. Weld we recognize and mourn the loss which we, in common with the public, and especially the agricultural and horticultural community, have sustained.

Resolved, That we would especially remember his enterprise, his thoroughness in all that he undertook and the universal esteem in which he was held for his social qualities; we would remember him as a man of strict honor and integrity. We recognize the

Divine Goodness which gave to Mr. Weld and to the Society such a long and useful life, which will be commemorated by the excellent portrait that now adorns our walls.

Resolved, That these proceedings be entered on our records, and that a copy be transmitted to the family of Mr. Weld.

BENJAMIN G. SMITH,
O. B. HADWEN,
ROBERT MANNING,
} *Committee.*

The memorial was unanimously adopted.

The Secretary announced the reception of letters from Henry Shaw, Sereno Watson, L. H. Bailey, Dr. C. A. Goessmann, Dr. William H. Farlow, and Charles E. Bessey, who were elected Corresponding Members of the Society at the April meeting, accepting the membership and thanking the Society for the honor.

The Librarian laid before the Society, vols. 5 and 6 of the "Dictionnaire de Pomologie," presented to the Library by the Enfants d'Andre Leroy, to complete the set of which the first four volumes were presented by their father, the author, and, in behalf of the Library Committee moved a vote of thanks for the gift. He also moved that the thanks of the Society be presented to the family of Charles M. Hovey, late President of the Society, for a large and valuable donation of agricultural and horticultural books from the library of their father. These votes of thanks were unanimously passed.

Miss CHARLOTTE M. ENDICOTT, of Canton, and
WILLIAM C. WINTER, of Mansfield.

having been recommended by the Executive Committee, were on ballot duly elected members of the Society.

The meeting was then dissolved.

BUSINESS MEETING.

SATURDAY, July 6, 1889.

A duly notified stated meeting of the Society was holden at 11 o'clock, Vice President CHARLES H. B. BRECK, in the chair.

The Chairman reported from the Executive Committee, a recommendation that the Society appropriate the sum of one thousand

dollars, or, so much thereof as may be necessary to complete the repairs in the Library Room. This appropriation was unanimously voted.

William H. Spooner reported from the same Committee, a recommendation that the Society adopt the following amendment to the Constitution and By-Laws, to form an additional section, numbered Section XL: —

The members of the Board of Control of the State Agricultural Experiment Station, provided for in the laws of the Commonwealth to be elected by this Society, shall be elected for three years; and a candidate for this office, and also one for a member of the State Board of Agriculture, as provided for in the laws of the Commonwealth, shall be nominated by the Nominating Committee provided for in Section XI of this Constitution and By-Laws, whenever the term of office of either of these officers is about to expire, and these officers shall be elected at the annual meeting, on the first Saturday in October next ensuing.

This amendment having been read twice, and having received a majority of votes, was laid over for consideration at the stated meeting on the first Saturday in October.

William H. Spooner offered the following vote: —

Voted, That this Society extends a cordial welcome to the Society of American Florists, and joins in an invitation to that society to hold its annual convention in August, 1890, in Boston, and offers the free use of its halls for that purpose.

The vote was unanimously passed.

The report of the Committee on the President's Address, was taken up and accepted. The amendments to the Constitution and By-Laws therein recommended, having been read twice, and changed so as to provide for a Committee on Plants of five instead of three members, received a majority vote, and were laid over for consideration on the first Saturday in October.

These amendments are as follows: —

In Section III, sixth line of the printed copy, strike out *three* and insert *two*, so that the line shall read; "A Committee for Establishing Prizes of *two* members."

Eighth line, strike out *four* and insert *three*, so that the line shall read: "A Committee on Gardens of *three* members."

In the tenth line strike out *plants and* and *seven*, and insert *five* in place of *seven*, so that the line shall read: — "A Committee on Flowers of five members."

After the tenth line insert "A Committee on Plants of five members."

In the twelfth line, strike out *three* and insert *two*, so that the line shall read:—"A Committee of Arrangements of two members."

In Section XX, second line, strike out *Plants and* before "Flowers," and insert *Plants* after "Flowers"; and strike out *three* and insert *two*, so that the first clause of the sentence shall read: —"This Committee shall consist of the Chairman of the Committee on Fruits, Flowers, Plants, Vegetables, and Gardens, and two other members, who shall be chosen as provided in Section III."

In Section XXI, second line, strike out *Plants and* before "Flowers," and insert after "Flowers," *the Committee on Plants*, so that the first sentence of the Section shall read: — "These Committees shall be the Committee on Fruits, the Committee on Flowers, the Committee on Plants, the Committee on Vegetables, and the Committee on Gardens."

In the same Section, after the first paragraph, insert the two following new paragraphs: —

"The duties of the Committee on Plants shall be to judge of the merits of all plants placed on exhibition, in doing which, they shall be guided by the Rules and Regulations now governing the Committee on Plants and Flowers. New and rare plants may be placed on exhibition at any time, and if so placed on any other than a regular exhibition day, the Secretary of the Society shall notify the Chairman of said Committee, or any member thereof, that an exhibit is at the Society's rooms for inspection, and such notes of the plant or plants shall be taken by the Chairman or other member of the Committee, as shall give intelligent information to the Committee of the merits of the same, that a fair and just award may be rendered by the Committee.

The Committes on Plants and Flowers, shall jointly select from our own members or otherwise, as they may deem best for the interest of the Society, a Special Committee of three members, who shall be well known experts in the cultivation of the Rose, to judge of all the exhibits presented at the Annual Rose Exhibition; and under no circumstances whatever shall the said Special Committee

have access to the Hall until the exhibition is ready for their inspection, and all lists of exhibits, handed to the Committee, shall be designated by numbers only, as indicated in the Schedule of Prizes. The reasonable expenses of said Special Committee shall be paid by the Society."

In Section XXII, second line, strike out *Plants and* before "Flowers," and insert *Plants* after "Flowers," and in the third line strike out *four* and insert *three*, so that the Section shall read: —"The Committee on Gardens shall consist of the Chairmen of the respective Committees on Fruits, Flowers, Plants, and Vegetables, and three members to be chosen as provided in Section III."

In Section XXIII, fifth and sixth lines, strike out *Plants and* before "Flowers," and insert *Plants* after "Flowers," and strike out *three* and insert *two*, so that the last clause of the Section shall read: — "and a Committee of Arrangements, to consist of the Chairmen of the Standing Committees on Fruits, Flowers, Plants, Vegetables, and Gardens, and two other members who shall be chosen as provided in Section III, to superintend the same."

In Section XXXIII, sixth line, strike out *Plants and* before "Flowers," and in the seventh line insert *Plants* after "Flowers," so that the clause shall read: — "or for any of the objects recommended by the Standing Committees on Fruits, Flowers, Plants, Vegetables, and Gardens."

The following named persons having been recommended by the Executive Committee as members of the Society, were on ballot duly elected.

Charles H. Hall, M. D., of Cambridgeport.
Mrs. Sarah D. J. Carter, of Wilmington.
Rev. William S. Smith, of Auburndale.
J. V. Pritchard, of Boston.
Aaron W. Spencer, of Boston.

Adjourned to Saturday, August 3, 1889.

BUSINESS MEETING.

SATURDAY, August 3, 1889.

An adjourned meeting of the Society was holden at 11 o'clock, Vice-President CHARLES H. B. BRECK, in the chair.

The Chairman announced the Committee to nominate Officers and Standing Committees of the Society for the year 1890, which had been appointed by President Walcott, agreeably to the Constitution and By-Laws, previously to his departure for Europe, as follows: —

William C. Strong, *Chairman.*

William H. Spooner,	Samuel Hartwell,
John G. Barker,	Jackson Dawson,
John C. Hovey,	Nathaniel T. Kidder,

Mr. Spooner declined to serve on the Committee, and it was voted that he be excused.

On motion of Robert Manning it was unanimously

Voted, That the Chairman of the meeting be authorized to fill any vacancy in the Committee.

The Chair appointed Charles N. Brackett to fill the vacancy caused by Mr. Spooner's declination.

The Secretary read the following letter.

SALEM, July 29, 1889.

Dear Mr. Manning:

Under the will of J. L. Russell, one thousand dollars is left to the Massachusetts Horticultural Society, "as a fund, the interest of which shall be paid annually to some competent person, who shall deliver a lecture on the latest discoveries of the connection of the Fungi with Horticulture." I expect to be able to pay this sum over shortly, and would like the Society to take some action in regard to accepting the same.

Yours truly,

T. F. HUNT.

On motion of Joseph H. Woodford, it was unanimously

Voted, That the bequest be accepted, and that it be known in the annals of the Society as the "John Lewis Russell Fund," and that it be devoted to the purpose for which Professor Russell bequeathed it.

The Secretary read a letter from Dr. P. MacOwan, Director of the Botanic Garden, Cape Town, South Africa, accepting with thanks, the Corresponding Membership in the Society to which he had been elected; also letters containing similar acknowledgments from Dr. T. G. Richardson of New Orleans, Dr. F. M. Hexamer of New Rochelle, N. Y., and Dr. M. Treub, Director of the Botanic Garden, Buitenzorg, Java.

The following named persons having been recommended by the Executive Committee for membership in the Society, were, on ballot duly elected.

George M. Hobbs, of Boston.
Benjamin M. Watson, Jr., of Jamaica Plain.
Frederick S. Davis, of West Roxbury.

Adjourned to Saturday, September 7.

BUSINESS MEETING.

Saturday, September 7, 1889.

An adjourned meeting of the Society was holden at 11 o'clock, Vice-President Charles H. B. Breck, in the chair.

William C. Strong, Chairman of the Committee to nominate candidates for Officers and Standing Committees of the Society for the next year, reported a printed list. The report was accepted, and it was

Voted, That the Commitee be continued, and requested to nominate candidates in place of any who might decline before election.

The Chairman announced the decease of Henry Weld Fuller, Ex-Vice-President of the Society, and William C. Harding. The following named gentlemen were appointed Committees to prepare memorials of these members.

On Mr. Fuller, William C. Strong, Robert Manning, and Benjamin G. Smith.

On Mr. Harding, John G. Barker, John C. Hovey, and Joseph H. Woodford.

William C. Strong announced the decease of Henry Shaw of St. Louis, Mo., and moved the appointment of a committee to prepare a suitable memorial. The motion was carried and the Chair appointed as that Committee Mr. Strong, Francis H. Appleton, and Robert Manning.

The following named persons, having been recommended by the Executive Committee, were on ballot duly elected members of the Society.

Sidney Lawrence, of East Lexington.
Charles W. Galloupe, of Swampscot.
J. Warren Clark, of Millis.
Henry Sargent Codman, of Brookline.

The meeting was then dissolved.

BUSINESS MEETING.

Saturday, October 5, 1889.

A Stated meeting of the Society, being the Annual Meeting for the choice of Officers and Standing Committees for the year 1890, was holden at 11 o'clock, the President, Henry P. Walcott, in the chair.

The Recording Secretary stated that the requirements of the Constitution and By-Laws in regard to notice of the meeting had been complied with.

Agreeably to the Constitution and By-Laws the Chair appointed John G. Barker, John C. Hovey, and William D. Philbrick, a Committee to receive, assort, and count the votes given, and report the number.

The polls were opened at fifteen minutes past eleven o'clock, and it was voted that they be kept open one hour, and that the check list be used.

William C. Strong, Chairman of the Committee to prepare a memorial of Henry Shaw, reported the following:

The Committee appointed to express the sentiment of the Society in regard to the late Henry Shaw, report as follows:

The Massachusetts Horticultural Society, while confining its main attention to its legitimate work within its own borders, has always been deeply appreciative of its obligations to the distinguished men in the old world, and in other parts of our own country, who have been eminent in the art of horticulture. Among these benefactors of the race we recognize our late Corresponding Member, Henry Shaw of St. Louis, as deserving our grateful remembrance. Retiring from active business pursuits with an ample competency at the age of forty years, he set an illustrious example of devotion of his large fortune and his time to the welfare of his fellow-men. By his princely gift of Tower Grove Park, — now famous throughout the country — to the city of St. Louis, and by the bequest to the State of Missouri, of his extensive Botanical Garden, which during his lifetime he planted and kept open for the benefit and enjoyment of all classes, he has conferred incalculable blessings which will continue to flow without end.

The scientific world is also largely indebted to him for the collection and publication of the works of his life-long friend, the late Dr. Engelmann. It is the good fortune of this Society to have received from Mr. Shaw himself a copy of these works during the last year, which gift will be not only a prized addition to our Library but a most interesting and valuable memorial of the giver.

On the 25th day of August last, after a well-rounded life of ninety years, Mr. Shaw rested from his earthly labors, in the firm hope of continued service beyond. We honor his memory; we mourn his loss; we tender our sympathy to his surviving friends.

WILLIAM C. STRONG,
FRANCIS H. APPLETON,
ROBERT MANNING,
Committee.

The memorial was unanimously adopted.

John G. Barker, Chairman of the Committee appointed at the last meeting to express the sense of the Society in regard to the decease of William C. Harding, reported as follows: —

The Committee appointed to prepare a memorial of the late William C. Harding respectfully report that they have attended to their duty and beg leave to submit the following: —

To an unusual extent of late we have been called upon to record the departure of our members. And now we are again reminded that the dread angel of death is no respecter of persons. This time the summons has come to our associate, Mr. William C. Harding, of Stamford, Conn., formerly of Boston Highlands, who was well known as an enthusiastic patron of horticulture, and also as a frequent and welcome contributor to our exhibitions, as may be seen by reference to the history of the Society for 1868 and subsequently. Those who enjoyed a personal acquaintance with Mr. Harding will bear witness that his love for all that is beautiful in nature knew no limit, as his well kept place and rare collection of plants gave abundant evidence. To him more than to any other person are the proprietors of Forest Hills Cemetery indebted for the many rare and beautiful trees, shrubs, and plants that now adorn those grounds, and that have done so much to make them attractive and to give to the Cemetery the wide reputation which it now enjoys; and we are informed that to the end of his life Mr. Harding maintained his great interest in their cultivation.

Resolved, That in the death of Mr. Harding we bow submissively to the will of our Heavenly Father, who doeth all things well, and we tender to his family our sincere sympathy in their great loss, trusting that he who called himself the Rose of Sharon, and the Lily of the Valley, may guide them and us all peacefully to that heavenly rest where sorrow and death are alike unknown.

Resolved, That this memorial be spread upon the records of the Society, and that a copy of the same be furnished to the family of Mr. Harding.

JOHN G. BARKER,
J. H. WOODFORD,
JOHN C. HOVEY,
} *Committee.*

This memorial, also, was unanimously adopted.

The following amendment to the Constitution and By-Laws, which was read twice and received a majority vote at the Stated Meeting on the sixth of July, came up for final action, and was adopted by a two-thirds vote: —

The member of the Board of Control of the State Agricultural Experiment Station, provided for in the laws of the Commonwealth to be elected by this Society, shall be elected for three years, and a candidate for this office, and also one for member of the State Board of Agriculture, as provided for in the laws of the Commonwealth, shall be nominated by the Nominating Committee provided for in Section XI of this Constitution and By-Laws, whenever the term of office of either of these officers is about to expire, and these officers shall be elected at the Annual Meeting on the first Saturday in October next ensuing.

This amendment forms an additional section of the Constitution and By-Laws, to be numbered XL.

William H. Spooner moved that the term of office of the present member of the Board of Control of the State Agricultural Experiment Station, expire on the first day of January 1891. This motion was carried.

Further amendments to the Constitution and By-Laws which were read twice at the Stated Meeting on the sixth of July, and then received a majority vote came up for final action, and were declared by the President to have received a two-thirds vote, and to be adopted as follows: —

In Section III, sixth line of the printed copy, strike out *three* and insert *two*, so that the line shall read — "A Committee for Establishing Prizes, of two members."

In the eighth line, strike out *four* and insert *three*, so that the line shall read: — "A Committee on Gardens of three members."

In the tenth line, strike out *Plants and*, and *seven* and insert *five*, so that the line shall read: — "A Committee on Flowers, of five members."

After the tenth line insert: — "A Committee on Plants of five members."

In the twelfth line, strike out *three* and insert *two*, so that the line shall read: — "A Committee of Arrangements of two members."

In Section XX, second line, strike out *Plants and* before "Flowers" and insert *Plants* after "Flowers," and strike out *three* and insert *two*, so that the first clause of the sentence shall read: —"This Committee shall consist of the Chairmen of the Committees on Fruits, Flowers, Plants, Vegetables, and Gardens, and two other members who shall be elected as provided in Section III."

In Section XXI, second line, strike out *Plants and* before ' Flowers," and insert after " Flowers," *the Committee on Plants*, so that the first sentence of the Section shall read: — " These Committees shall be the Committee on Fruits, the Committee on Flowers, the Committee on Plants, the Committee on Vegetables, and the Committee on Gardens."

In the same section, after the first paragraph, insert the two following new paragraphs: —

" The duties of the Committee on Plants shall be to judge of the merits of all plants placed on exhibition, in doing which they shall be guided by the Rules and Regulations now governing the Committee on Plants and Flowers. New and rare plants may be placed on exhibition at any time, and if so placed, on any other than a regular exhibition day, the Secretary of the Society shall notify the Chairman of said Committee, or any member thereof, that an exhibit is at the Society's rooms for inspection, and such notes of the plant or plants shall be taken by the Chairman or other member of the Committee, as shall give intelligent information to the Committee of the merits of the same, that a fair and just award may be rendered by the Committee.

The Committees on Plants, and Flowers shall jointly select from our own members or otherwise, as they deem best for the interest of the Society, a Special Committee of three members, who shall be well-known experts in the cultivation of the Rose, to judge of all the exhibits presented at the Annual Rose Exhibition, and under no circumstances whatever shall the said Special Committee have access to the Hall until the Exhibition is ready for their inspection, and all lists of exhibits handed to the Committee shall be designated by numbers only as indicated in the Schedule of Prizes. The reasonable expenses of said Special Committee shall be paid by the Society."

In Section XXII, second line, strike out *Plants and* before " Flowers," and insert *Plants* after " Flowers," and in the third line strike out *four* and insert *three*, so that the Section shall read: — " The Committee on Gardens shall consist of the Chairmen of the respective Committees on Fruits, Flowers, Plants, and Vegetables, and three members who shall be chosen as provided in Section III."

In Section XXIII, fifth and sixth lines, strike out *Plants and* before "Flowers," and insert *Plants* after "Flowers," and strike out *three* and insert *two*, so that the last clause of the Section shall read: — "and a Committee of Arrangements, to consist of the Chairmen of the Standing Committees on Fruits, Flowers, Plants, Vegetables, and Gardens, and two other members who shall be elected as provided in Section III, to superintend the same."

In Section XXXIII, sixth line, strike out *Plants and* before "Flowers," and in the seventh line insert *Plants* after "Flowers," so that the clause shall read: — "or for any of the objects recommended by the Standing Committees on Fruits, Flowers, Plants, Vegetables, and Gardens."

The following named persons, having been recommended by the Executive Committee as members of the Society, were, on ballot duly elected.

George W. Hammond, of Boston.
Hon. Jediah P. Jordan, of Roxbury.
George Hollis, of South Weymouth.
E. Bentley Young, of Boston.
William J. Hargraves, of Boston.
Lucius T. Peck, of Dorchester.
Richard T. Lombard, of Wayland.
Patrick Welch, of Dorchester.
Henry J. Bigelow, M. D., of Boston.

The polls were closed at a quarter past twelve, and the Committee to receive, assort and count the votes and report the number, reported the whole number of ballots to be 179
Necessary for a choice, 90

The report of the Committee was accepted, and the persons reported as having the number of ballots necessary for a choice were, agreeably to the Constitution and By-Laws, declared by the President to have a majority of votes, and to be elected Officers and Standing Committees of the Society for the year 1890.

Adjourned to Saturday, November 2.

BUSINESS MEETING.

SATURDAY, November 2, 1889.

An adjourned meeting of the Society was holden at 11 o'clock, the President, HENRY P. WALCOTT, in the chair.

The President reported from the Executive Committee, a recommendation that the Society appropriate for prizes for the year 1890, the same sum, and that it be divided in the same proportions as the present year, viz: —

For Prizes and Gratuities for			Plants and Flowers,	$3,000
"	"	"	Fruits,	1,700
"	"	"	Vegetables,	1,000
"	"	"	Gardens, Greenhouses, etc.,	300
			Total,	$6,000

The report was accepted, and agreeably to the Constitution and By-Laws, was laid over to the Stated Meeting on the first Saturday in January for final action.

On motion of John G. Barker, it was

Voted, That the amendments to the Constitution and By-Laws, relating to the establishment of a Committee on Plants, etc., adopted at the last meeting, shall not go into effect until the year 1891.

Benjamin G. Smith, from the Committee appointed to prepare a memorial of the late Henry Weld Fuller, presented the following report: —

Henry Weld Fuller was born in Augusta, Maine, January 16, 1810, and died in Boston, August 14, 1889. He came of a leading family of Maine, his father being Judge Henry W. Fuller of Augusta, and his mother a sister of Miss Hannah Flagg Gould, the poet. Chief Justice Melville W. Fuller is a nephew of the late Mr. Fuller, and Margaret Fuller was a near relative. At an early age Mr. Fuller entered Bowdoin College. Henry W. Longfellow, Franklin Pierce, and John P. Hale were college mates, though not classmates of his. In 1828 he graduated, having the Latin Salutatory, and three years afterwards returned to deliver the Latin Valedictory at Commencement, taking the degree of A. M. At

the Commencement of 1836, he pronounced the annual oration before the Athenæan Society. Having read law with his father and at the Cambridge Law School, he was admitted to the Kennebec bar, and for ten years he was a partner with his father. In 1841 he removed to Boston, and here for thirteen years was in partnership with Elias H. Derby, and for eleven years was clerk of the Circuit Court of the United States. Since resigning the latter position, he has acted as trustee and treasurer for different persons and corporations.

The talents of Mr. Fuller were of the highest order; in him were united a sound understanding, a rich and vigorous imagination, and a logical precision of thought. His learning was extensive, critical, and profound. In manners, Mr. Fuller was a courtly gentleman, possessing that kindness of heart and delicacy of feeling which made him study the wants and anticipate the wishes of all whom he knew. His refined taste was marked. His drawings are very fine, and one of the monuments of his taste is the Cemetery at Woodlawn, with which he had been connected since 1851, when he took it as a rough pasture, and by his own skill and good judgment laid out the avenues and paths, and designed the gateway and arbors, bringing it by his daily care and oversight into its present state of beauty.

He was never remembered to do an unkind act. Entire unselfishness was a most marked trait in his character; he never thought of himself, but always of others. He was never too weary to give help to those who needed it. His happiness was entirely connected with his intense devotion to his home and friends.

His wonderful cheerfulness and brightness he always brought into his home; amid all the sorrows and trials of his life, which were many and severe, his smile alone was a benediction. His sunny disposition and religious character made him feel that all trouble was sent for the best. Honesty and strict integrity through all his severe trials, and a strong desire to leave an honest name behind him were foremost.

For many years Mr. Fuller was Vice-President of this Society, and Chairman of the Committee on Gardens, and a member of the Executive Committee. His magnanimity, when a piece of plate was voted to him for his long and acceptable service as Chairman of the Garden Committee, in gracefully declining to accept it, adding that he had been more than compensated in performing the

agreeable duties of that position, will be remembered. He was also Chairman of the Society of Arts of the Institute of Technology; a member of the Webster Historical Society; of the New England Historic Genealogical Society, and of the American Association for the Advancement of Science.

In 1835 Mr. Fuller was married to Miss Mary Storer Goddard, daughter of Nathaniel Goddard, a well known merchant of Boston. Two sons have died, one having been lost, with all his family, in a cyclone which swept the Indian Ocean, as they were returning from Calcutta, but three daughters survive him.

Resolved, That in the death of Mr. Fuller, not only this Society, but the whole community, suffer a severe and irreparable loss.

Resolved, That these sentiments of respect and affection, with the earnest expression of sincere condolence, be communicated to the bereaved family of the deceased.

For the Committee,

Benjamin G. Smith, *Chairman.*

John G. Barker seconded the motion to adopt the memorial, which he considered an admirable one; and added that Mr. Fuller was truly an unusual gentleman — that to know him was to respect him. He was a man of marked intelligence; one whose ideas were progressive and valuable; who was quick to recognize real improvements in plans and methods, and was desirous that they should be adopted. In his own intercourse with Mr. Fuller, Mr. Barker had always found his conversation interesting and refreshing upon all subjects, and in the line of cemetery work especially, Mr. Fuller's ideas were suggestive and instructive. Alluding to the fact that Mr. Fuller declined nomination for the presidency of the Society, Mr. Barker added that for himself he felt it an honor to be made Chairman of the Committee on Gardens, after Mr. Fuller had held that position so long and to the great satisfaction of the Society.

The memorial was unanimously adopted.

The Secretary read a letter from the relatives of the late Henry Shaw, of St. Louis, Mo., acknowledging the receipt of the memorial of Mr. Shaw adopted by the Society, and thanking the Society for this mark of appreciation of his services in the advancement of horticulture, botany, and rural pursuits. The Board of

Trustees of the Missouri Botanical Garden also acknowledged with thanks the receipt of the same memorial.

The Secretary also laid before the Society a letter from Louis B. Harding, acknowledging the testimonial adopted by the Society in memory of his father, the late William C. Harding of Stamford, Connecticut.

Adjourned to Saturday, December 7.

BUSINESS MEETING.

SATURDAY, December 7, 1889.

An adjourned meeting of the Society was holden at 11 o'clock, the President, HENRY P. WALCOTT, in the chair.

The President, as Chairman of the Executive Committee, reported a recommendation that the Society hold an exhibition in August, 1890, during the time of the Convention of the Society of American Florists, this exhibition to be considered a substitute for that portion of the Annual September Show which includes Plants and Flowers. This report was accepted and adopted.

The President also reported from the Executive Committee, the Schedule of Prizes for 1890, with the approval of that Committee. After amendment so as to provide that duplicates should be allowed in the different classes of Roses at the Rose Exhibition, the Schedule was adopted.

The Annual Report of the Committee on Plants and Flowers was read by Joseph H. Woodford, Chairman.

The Annual Report or the Committee on Fruits was read by E. W. Wood, Chairman. This report was accompanied by a special recommendation that the Society award the Prospective Prize for the best Seedling Strawberry to Warren Heustis for his seedling, the Belmont. This recommendation was approved by the Society.

John Robinson, from the Library Committee, read the Annual Report of that Committee.

M. B. Faxon, Secretary of the Committee on Window Gardening, read a statement of the receipts and expenditures of that Committee.

The above mentioned reports were severally accepted, and referred to the Committee on Publication.

Further time was granted to the Committee on Window Gardening to prepare a report.

Benjamin G. Smith, from the Committee to prepare a memorial of the late Henry Weld Fuller, read a letter from his daughters, conveying their thanks for the tribute to the memory of their father, adopted by the Society.

James F. M. Farquhar, of Roslindale,

having been recommended by the Executive Committee as a member of the Society, was on ballot duly elected.

Adjourned to Saturday, December 14.

BUSINESS MEETING.

Saturday, December 14, 1889.

An adjourned meeting of the Society was holden at 11 o'clock, the President, Henry P. Walcott, in the chair.

The Annual Report of the Committee on Vegetables was read by Charles N. Brackett, Chairman, accepted, and referred to the Committee on Publication.

The President, as Chairman of the Committee on Repairs and Alterations of the Society's Building, appointed on the 26th of January, presented the following report: —

The Committee appointed for the purpose of making certain repairs and changes in this building, occasioned by the fire of December 30, 1888, beg leave to submit the following report: —

An early conference with the proper authorities of the city satisfied the Committee that it was expedient to comply without hesitation, with the requirements of the Inspectors of Buildings, and reconstruct the building, so far as possible, with all the safeguards against fire. These new arrangements involved the expenditure of a much larger sum of money than was received from the insurance companies.

It was also found in the course of the new work for the improvement of the Library accommodations, that this portion of the

building suffered from very serious structural defects, which required immediate remedy, and would have required such attention even in case no extension of the Library had been entered on. Extensive changes were therefore made, and your Committee believe that the Library Room is now in better condition than at any time before.

The roof was also defective and the Committee deemed the present occasion a fitting one for making much needed repairs.

The Committee believe that the changes in the building have commended themselves to the judgment of the members. The Society is already enabled to secure better rents for the use of its more attractive halls, and will undoubtedly be able to attract a more desirable class of patrons than in the past.

Your Committee take comfort in the belief that no very considerable expenditures will be necessary for repairs or changes in the upper portion of the building for many years.

All bills contracted for the necessary work have been paid.

Appended to the report was a detailed statement of the cost of the repairs and alterations, which had been made, the total amount being $17,487.89

To meet this, there were collections of insurance —

For Loss on Building	$4,746.92	
For Loss on Contents	5,700.00	
		$10,446.92
Paid from the Income of the Society		$7,040.97

The report was accepted and referred to the Committee on Publication.

Robert Manning read his Annual Report as Secretary and Librarian, which was accepted and referred to the Committee on Publication.

Adjourned to Saturday, December 21.

BUSINESS MEETING.

SATURDAY, December 21, 1889.

The meeting last Saturday adjourned to this day, but as no quorum was present it dissolved.

REPORT

OF THE

COMMITTEE ON PLANTS AND FLOWERS,

FOR THE YEAR 1889.

By JOSEPH H. WOODFORD, Chairman.

Once more the time has come round when your Committee must render an account of their doings in this department of the good work our Society has accomplished during the past year.

The year opened rather discouragingly, on account of the fire which occurred in our building on the 30th of last December, rendering the halls unfit for exhibition purposes. As the repairs were not completed till the latter part of July, our shows for the first half of the year were held at a great disadvantage, and were probably much smaller than they would have been under more favorable circumstances.

The spring opened some two weeks earlier this year than last, and the frosts held off fully two weeks later in the fall. Thus a good month was added to the growing season for out-door plants and consequently a month more of real enjoyment has been experienced in our gardens than is usually allotted to us in this vicinity.

As a general rule plants have been of slow growth this season, because we have had a greater precipitation of moisture, and also rather cooler weather than the average of past summers.

But neither the frequent rains nor the cool weather, discouraged our exhibitors, for we had very good displays all through the year, and some of unusual excellence. In making up our report we include a special notice of the most commendable features of each

of the exhibitions as they occurred, somewhat in the form of a diary for future reference.

In February, there were placed on the table in the Library room, Roman Hyacinths, Primroses, Camellias, and Orchids. Among the last named were *Cœlogyne cristata* by Mrs. Francis B. Hayes; *Cattleya Trianæ Smithæ*, a remarkably fine variety with very large and highly colored flowers, by Pitcher & Manda, of Short Hills, N. J., and cut flowers of *Dendrobium Wardianum*, from Edwin Sheppard & Son.

February 9, James Comley, showed his seedling Rose, the Oakmont, — named after Mrs. Francis B. Hayes's estate in Lexington. This rose was exhibited several times during the year, and received considerable attention from rose growers.

March 2, Mrs. Henry F. Durant sent in a splendid specimen plant of *Dendrobium nobile*, bearing four hundred and thirty-four flowers. John L. Gardner also sent a *Phajus grandifolius* having eleven spikes bearing two hundred flowers. Thomas W. Dee showed a *Lilium Harrisii* with three stalks, bearing thirty-one large fragrant flowers. The above named three plants were remarkably fine specimens and reflected much credit on the growers.

E. Sheppard & Son again brought their new *Dendrobium nobile*, bearing flowers of a much deeper color than the type. This variety was noticed in our last year's report.

March 9, Fisher Brothers & Co. made a lovely show of twenty-five pots of *Cyclamen giganteum*, interspersed with small plants of *Cocos Weddelliana* and *Isolepsis gracilis*. Mrs. Francis B. Hayes showed for the first time, a hardy Rhododendron, grown from seed by her gardener, James Comley. This bears a large truss of white flowers with brown spots, and being very beautiful it has been honored with the name of Mrs. Cleveland. Another exhibition of this same Rhododendron was made March 16th, together with thirty varieties of Hybrid Perpetual Roses, and the Oakmont.

SPRING EXHIBITION.

March 27, 28, and 29.

Owing to the damaged condition of our halls, this was not so extensive as the previous year, yet it was a splendid show of good plants and flowers, and exhibitors competed for nearly all the prizes offered.

The Roses shown by Thomas H. Meade, Mrs. Francis B. Hayes, Norton Brothers, and John Simpkins, were of great excellence, and won the admiration of every one.

The Orchids from Benjamin Grey, E. W. Gilmore, and Pitcher & Manda, of Short Hills, N. J., fascinated the visitors by their quaint forms and gorgeous colorings.

The Dutch bulbs were flowered in perfection, and their various colors and perfumes were appreciated by all. We noticed a decided advance in the flowers of Cinerarias, as grown by Nathaniel T. Kidder and Thomas Clark; and in Pansies as grown by Denys Zirngiebel and Joseph S. Fay.

Mrs. Anna L. Moring's pyramidal Mignonette was very luxuriant, some of the flower spikes being over a foot long and quite dense. The *Primula obconica* shown by Fisher Brothers & Co. was very superior, having been grown from seed saved from the largest flowers of the best plants, and showed great improvement in the size and quality of this beautiful flower.

The Botanic Garden of Harvard University sent a large collection of Herbaceous Plants in pots and pans, all well flowered and making a very fine display.

A new Rose, Souvenir de Wootton, sent by C. Strauss & Co., of Washington, D. C., was shown for the first time. The color was something between a William H. Bennett and a Jacqueminot, but having come from such a distance it was not in as fine condition as if the specimen had been taken fresh from plants grown in this vicinity, yet it possessed sufficient merit to command a First Class Certificate.

April 13th, May 4th, and May 11th, James Comley showed his seedling Rose, the Oakmont, fully proving that it is a good bloomer as well as a beautiful rose.

May 11th, the Calceolarias shown by Kenneth Finlayson, gardener to Dr. C. G. Weld, and William J. Martin, gardener to Nathaniel T. Kidder, were very fine, as were also the Pansies from Denys Zirngiebel. John L. Gardner sent the following Orchids in splendid bloom:

Calanthe Textori,
Cypripedium caudatum,
C. Lawrenceanum,
Dendrobium Dearei,
Lycaste Deppei,
Odontoglossum maculatum.

On May 25th, H. H. Hunnewell made a grand display of two hundred vases of hardy Rhododendrons, forty of which were named, fifty vases of Ghent and Mollis Azaleas, and forty vases of Indian Azaleas. Mrs. Francis B. Hayes also showed a grand collection of Rhododendrons, Azaleas, Japan Maples, etc., and Joseph H. Woodford sent in ten pans of seedling Clematis in great variety. The eight varieties of Carnations, by Frederick C. Fisher,—Victor, Snowdon, Degraw, Anna Webb, Hinze's White, Florence, Allegatière, and Catharine Paul, were finely grown, with large flowers, and very fragrant.

RHODODENDRON SHOW.

June 1.

This exhibition was changed from June 8th, on account of the earliness of the season.

The display was superb and attracted a large number of admirers of these most beautiful flowers. The chief contributors were H. H. Hunnewell, Mrs. Francis B. Hayes, and John L. Gardner. Mr. Hunnewell sent forty-four named varieties, and two hundred vases of unnamed.

John L. Gardner has established the fact that a large number of the Rhododendrons heretofore supposed to be tender varieties are really hardy, he having grown them for a number of years in the same manner and under the same conditions as the kinds recognized as hardy. The following are some of the varieties formerly supposed to be tender, but whose hardiness is now proved, —Lady Emily Cathcart, Mrs. John Clutton, Minnie, Lord John Russell, Atrorubens, and Queen.

The display of German Iris exceeded all previous exhibits in quantity and in variety of colors, Robert T. Jackson showing sixty-eight varieties in his collection, while Edwin Fewkes & Son and J. W. Manning, had rich collections.

First Class Certificates of Merit were awarded to Joseph H. Woodford, for double seedling Clematis, in large variety; Robert T. Jackson, for seedling German Iris, after the style of *Susiana;* and Thomas C. Thurlow for seedling Ghent Azaleas.

Among the other numerous exhibits, we noticed small displays of hardy Pyrethrums, in a variety of colors and forms. We predict

that this flower will come to the front, and in the near future will be largely grown by all lovers of hardy herbaceous plants.

June 8th was show day for Herbaceous Pæonies, and we are glad to note that the exhibition was of a superior character. John L. Gardner took the lead with four blooms each of seventeen varieties. William C. Strong sent a fine collection, including one called Atrosanguinea which, when only partially opened, resembled a Jacqueminot rose in both form and color, and was very handsome; but to our mind the choicest and daintiest collection was shown by Miss Ellen M. Harris, including double, semi-double, and single flowers.

A First Class Certificate of Merit was awarded to Joseph H. Woodford for a seedling Clematis; the flowers were white with gray anthers and seven inches in diameter.

June 18th, Sewall Fisher showed a seedling Carnation, named Mrs. Fisher. The flowers were of large size and good substance; the color pure white. It was awarded a First Class Certificate of Merit. This Carnation was shown again in November, in fully as good form and style as when first exhibited, and was pronounced to be a fine acquisition to this fragrant class of flowers.

ROSE EXHIBITION.

June 18 and 19.

This also was held a week earlier than the Schedule time, and was not as complete as usual, owing to the unfavorable weather during the growing season, nor did the individual flowers show that degree of perfection which we like to see at the time when the "Queen" should be looking her best.

The most beautiful collection of Hybrid Perpetual Roses was that sent in by John B. Moore & Son, on the second day. They were cut with long stems, which had not been disbudded, showing the terminal rose in perfection, with the surrounding buds in all stages of development.

Another fine display was that made by Charles W. Galloupe, consisting of eleven varieties of Tea Roses, each in a large vase. They were arranged by his gardener, Mr. Lalley, with a freedom from stiffness and formality which made them exceedingly attractive.

The Orchid family were out in full force and presented some of the most wonderful forms and gorgeous colorings of any class of plants. The Cypripediums from Pitcher & Manda, of Short Hills, N. J., included many rare kinds, and some of them so beautiful that one might with propriety affirm that they would adorn some beautiful Cinderella in case she lost her glass slipper. Among the rarest ones were:

C. euryale,
C. Gandavense,
C. Harrisianum Pitcherianum,
C. Javanico superbiens,
C. Pleistochlorum,
C. superciliare ornatum.

Among less rare kinds were fine specimens of *C. Veitchii*, *C. Lawrenceanum*, and others. Other noticeable specimens were *Oncidium crispum*, having about fifty flowers on the stem, each measuring four inches across, and *Trichopilea crispa* var. *gloxinæflora* with richly colored flowers.

John L. Gardner's exhibition of Orchids, interspersed with palms, was very imposing, and formed an attractive feature of the show.

The display of Delphiniums was very large, comprising some of the best spikes ever seen of these flowers.

Nathaniel T. Kidder showed flowers of *Syringa Pekinensis*. This is a weeping shrub introduced by F. L. Temple. It is very graceful in form and handsome in foliage; the flowers, are white, with a fragrance of the privet, and are produced in large panicles on the ends of the branches, giving to a full grown plant the appearance of a large green umbrella with a beautiful white fringe.

June 29th was not a prize day, yet the exhibition of *Iris Kœmpferi* was the best we ever had. When we recollect that this species of Iris was introduced into this country only a few years ago, we are surprised at the progress made in producing new varieties; and yet we ought not to be, for our cultivators know a good thing when they see it, and then the desire comes to improve even that which is already good. William C. Strong showed the largest collection. John L. Gardner sent three flowers each of twenty-two named varieties. Edwin Fewkes & Son showed in their numerous collection some fine seedlings, which they had raised from carefully cross-fertilized seed, thereby getting new colors and improved flowers.

E. Sheppard & Son showed thirty varieties of named Pelargoniums in fine form and rich colors.

On account of the earliness of the season the weekly show appointed for July 13, was held in connection with that of July 6th, and for the same reason all the other weekly shows preceding the Annual Exhibition were held a week earlier than the Schedule time. These exhibitions were very good indeed. The flowers of all classes in their season being at their best in each display commanded a large attendance of visitors, who found great pleasure in these free exhibitions of flowers, for they were such as no other city on this continent, and no other society provides weekly for the education of the masses in floriculture. We can take credit to ourselves for the liberality manifested by this Society in thus opening these shows to the public without charge, and when we hear the favorable comments made by eminent members of our fraternity from distant places, who visit our shows while sojourning temporarily in this city, it does our hearts good to know from their testimony that no other Society in the United States compares with our own, in the quality of its exhibitions or the welcome given by its members to visitors, either from this vicinity or from a distance.

As we predicted, in one of our former reports, that certain flowers would become more prominent in the near future, we take pleasure in again alluding to that subject and noting the progress which has lately been made. The first to which we will call attention is the Sweet Pea. This flower has such intrinsic merit that it is no wonder every one wants the old kinds. But some of our seed growers are continually introducing new varieties. One of the latest of these is Miss Blanche Ferry, grown by D. M. Ferry & Co., of Detroit, Michigan, which is of brighter color than the old standard, Painted Lady.

One excellent quality of the sweet pea is that it can be used in connection with all other flowers, and while it does not cheapen the others or lose its own individuality, it is always sweet and beautiful. James F. C. Hyde exhibited forty-four varieties. The M. B. Faxon Special Prizes were taken by Joseph H. Woodford for a bouquet, and William Patterson for twenty-five varieties. Every one having a garden should grow a mixed collection of Sweet Peas.

The Tropæolum is another flower that is engaging the attention of gardeners to a greater extent than formerly. The colors are excellent, and every day in the summer it gives out its wealth of

bloom, so that with only a few plants one can always have a bunch of flowers for a friend. Dr. C. G. Weld took M. B. Faxon's Special Prize for twenty-five vases of this beautiful flower.

The Aster is still another flower that is being grown lately more than ever before, the colors are being made clearer and the flowers more nearly perfect. R. & J. Farquhar & Co., exhibited one hundred and fifty-six varieties and Honorable Mention of their exhibit is hereby recorded. Fearing Burr showed some of large size, clear colors, and particularly good form. Joseph H. White took the M. B. Faxon Special Prize for twenty-five blooms. Joseph S. Fay, and Nathaniel T. Kidder showed some fine flowers.

The *Dianthus Heddewigii*, the Marigolds, the *Phlox Drummondi*, and the Zinnias exhibited by L. W. Goodell showed an improvement over the older kinds.

July 27th Pitcher & Manda of Short Hills, N. J., showed a new variety of *Achillea serrata* called the Pearl — a whiter flower and a trifle larger than the old one. It was awarded a First Class Certificate.

August 3d H. H. Hunnewell made a grand showing of Orchids, which were arranged with palms, ferns, and grasses, by Mr. Harris, in his usual felicitous manner.

The following were in the collection : —

Aërides quinquevulnerum
Bollea Patinii
Cattleya chrysotoxa
C. Gaskelliana
C. gigas
C. imperialis
Cattleya Sanderiana
C. Schofieldiana
Cypripedium Curtisii
C. Dominii
C. grande
Dendrobium suavissimum

and many others.

August 31st Jackson Dawson brought from the Arnold Arboretum, a beautiful shrub called *Symplocos paniculatus*, bearing cobalt blue berries. This was very striking in effect, as it was well covered with the berries, and will make a beautiful addition to garden shrubbery. It was awarded a First Class Certificate of Merit.

Honorable Mention is made of a seedling Dahlia shown by William E. Endicott, light pink in color, and named John Frost. Also of *Hibiscus flavescens*, shown by James F. C. Hyde; of *Phlox Drummondi*, shown by L. W. Goodell, and of the Japan Anemone, Honorine Jobert, shown September 7 by Walter Hunnewell.

ANNUAL EXHIBITION.

September 17, 18, 19, and 20.

This was more sombre than in most years, owing to the unusual absence of the brilliant colors, both in foliage and flowers generally seen at these shows. Palms seemed to predominate, whereas they should be interspersed with the ornamental foliaged plants, such as Crotons and Dracænas to enliven them, and make the grouping more attractive. William E. Doyle brought the largest collection of plants, while the exhibits made by Joseph H. White, H. H. Hunnewell, Nathaniel T. Kidder, Thomas Clark, and Dr. C. G. Weld, were very effective, being mostly of large well grown plants. Mr. Hunnewell was awarded the Society's Silver Medal for well grown Dracænas. Mrs. E. M. Gill took the M. B. Faxon Special Prize for a vase of single Dahlias, and William C. Strong won the Hunnewell Prize for Evergreen Trees and Shrubs.

October 5 John L. Gardner showed for the first time *Vanda Kimballiana* which was awarded the Society's Silver Medal.

October 19 Mrs. Anna L. Moring sent in seven varieties of splendidly grown Chrysanthemums. John Simpkins was awarded a First Class Certificate of Merit for a seedling Chrysanthemum, a large flower fully six inches in diameter; color white, slightly pinkish, tinged lemon in the centre, and named Miss R. Simpkins.

October 26 John L. Gardner showed *Æschynanthus grandiflorus*. This is a drooping shrub, bearing trusses of crimson-yellow flowers on the ends of the branches. It was introduced into this country a good many years ago, but we are always glad to greet an old favorite, and to Charles M. Atkinson, gardener to Mr. Gardner, was awarded a First Class Certificate of Merit for Superior Culture of this plant.

The beautiful collections of Wild Flowers and Ferns that have been exhibited by Mrs. P. D. Richards, E. H. Hitchings, Severance Burrage, Walter E. Coburn, and Miss M. W. Nichols during the season, have been a source of great pleasure to a numerous constituency of ardent admirers. Nearly every Saturday during the year specimens of our native flora have graced our tables, and when we take into consideration that these are all correctly marked with both the botanical and the common names, we see at once the value of each exhibit to students in botany, and even to the ordinary observer. These collectors cannot be too highly commended for their perseverance in so good yet so arduous a work.

THE CHRYSANTHEMUM EXHIBITION.

November 12, 13, 14, and 15.

This was the crowning show of the year. Although the individual plants were not generally equal in robustness to those of former years, some of them were superior, and reflected great credit on the gardeners having them in charge. Walter Hunnewell's twenty plants, Mrs. Francis B. Hayes's twelve, and H. L. Higginson's four, were exceptionally fine, but the greatest progress was evinced in the display of cut flowers, as grown by John Simpkins and Charles J. Powers. Never were there seen in our halls, such wonderful flowers. They were enormous in size, yet were as perfect in form, and as finely finished in every respect as the ordinary sized ones. In short they were rich to an extreme, and beautiful beyond the comprehension of those who have not kept pace with the development of this grand production of China and Japan.

The new seedlings shown by John Simpkins, Edwin Fewkes & Son, George Hollis, and Henry P. Walcott, gave evidence of great progress in the right direction, for they were generally large flowers of fine form and decided colors, any one of them being far in advance of the seedling to which was awarded the Silver Cup offered by Mrs. President Harrison, at Indianapolis.

John Simpkins took the first special prize, the Society's Silver Medal, for Sandyside, the best seedling of 1889. Edwin Fewkes & Son received the second special prize, for Waban, and George Hollis took the third special prize, for Aureole.

Edwin Fewkes & Son carried off the Bradlee Plate, offered for the best fifty blooms, comprising thirty Japanese, ten Chinese Incurved, and ten Anemone Chrysanthemums. Honorable Mention is made of a pink variety of the Mrs. Alpheus Hardy Chrysanthemum, exhibited by Peter Henderson & Co., of New York, and named Louis Boehmer. Honorable Mention is made of a new Rose grown by Peter Ball, called the Duchess of Albany. It resembles La France but is pink all over and of a deeper color than La France. Honorable Mention is also made of a new seedling Carnation grown by William Nicholson, called Mrs. Elliot. This is of a deeper color than Grace Wilder, and considerably larger.

A First Class Certificate was awarded to E. W. Gilmore for the Orchid, *Sophronitis coccinea grandiflora*. Honorable Mention is also made of an orchid shown by Pitcher & Manda, of Short Hills,

N. J., named *Cypripedium Maseerellianum*, this is synonymous with *C. Leeanum* and very much resembles *C. Spicerianum*.

This exhibition was the most successful and certainly the most satisfactory of any we have held this year, and it showed more progress in the cultivation of plants and flowers than during any previous year within the recollection of the oldest member of our Society.

The prizes for Herbaceous Plants have received the attention of only one exhibitor during the whole season. Therefore the Appleton Silver Medal has been awarded to J. W. Manning for superior collections contributed at the times specified in the Schedule.

Our report would not be complete if we did not drop flowers in pleasant remembrance, on the graves of our late associates, Edwin Fewkes, James Cartwright, and James O'Brien, who have died during the past year, having lived long, useful, and worthy lives as successful florists. *Requiescant in pace.*

Of the appropriation of $3,000 for Plants and Flowers, your Committee have awarded in prizes and gratuities $2,967.

All of which is respectfully submitted.

JOSEPH H. WOODFORD,
F. L. HARRIS,
M. H. NORTON,
ARTHUR FEWKES,
JOHN H. MOORE,
WM. J. STEWART,

Committee on Plants and Flowers.

PRIZES AND GRATUITIES AWARDED FOR PLANTS AND FLOWERS.

February 5.

Roman Hyacinths.—Six six-inch pots, John L. Gardner, . . $4 00

Gratuities:—

Mrs. Francis B. Hayes, Basket of Camellias, ... 5 00
George Seaverns, Six Primroses, ... 1 00

February 9.

Gratuity:—

Mrs. Francis B. Hayes, Centre Piece for Table, ... 3 00

March 2.

Gratuities:—

Edward Butler, gardener to Mrs. Henry F. Durant, *Dendrobium nobile*, with 434 flowers, ... 3 00
John L. Gardner, *Phaius grandifolius*, ... 3 00

March 9.

Gratuities:—

Fisher Brothers, Twenty-five pots of Cyclamens, ... 5 00
John L. Gardner, *Cattleya Trianæ*, ... 1 00
Mrs. Francis B. Hayes, Cut Flowers, ... 1 00

March 16.

Gratuities:—

Mrs. Francis B. Hayes, Twenty varieties of Hybrid Perpetual Roses, ... 3 00
Frederick C. Fisher, Eight varieties of Carnations, . . . 1 00

SPRING EXHIBITION.

March 27, 28, and 29.

Theodore Lyman Prizes.

Indian Azaleas.—Six distinct named varieties, in pots, Nathaniel T. Kidder, the Lyman Plate, value $35 00
Orchids.—Ten plants in bloom, E. W. Gilmore, the Lyman Plate, value 30 00
Second, E. W. Gilmore, the Lyman Plate, value . . . 25 00

Society's Prizes.

INDIAN AZALEAS.—Four distinct named varieties, in not exceeding ten-inch pots, A. W. Spencer, ... $10 00
Second, Kenneth Finlayson, gardener to Dr. C. G. Weld, . 8 00
Two distinct named varieties, Kenneth Finlayson, . . . 6 00
Specimen Plant, named, Nathaniel T. Kidder, ... 4 00
Second, Thomas Clark, ... 3 00
Single plant, of any named variety, in not exceeding an eight-inch pot, Kenneth Finlayson, ... 3 00
Second, A. W. Spencer, ... 2 00
HYBRID PERPETUAL ROSES.—Twelve cut blooms, of not less than six distinct named varieties, excluding Gen. Jacqueminot, Mrs. Francis B. Hayes, ... 6 00
TENDER ROSES IN VASES.—Twelve blooms of Catherine Mermet, Thomas H. Meade, ... 5 00
Twelve blooms of Cornelia Cook, Thomas H. Meade, . . . 5 00
Twelve blooms of La France, Thomas H. Meade, . . . 5 00
Second, Mrs. Francis B. Hayes, ... 4 00
Twelve blooms of Niphetos, Thomas H. Meade, ... 5 00
Twelve blooms of The Bride, Thomas H. Meade, . . . 5 00
ORCHIDS.—Three plants in bloom, Benjamin Grey, ... 8 00
Single plant in bloom, Benjamin Grey, ... 5 00
STOVE OR GREENHOUSE PLANT.—Specimen in bloom, other than Azalea or Orchid, named, the second prize to Mrs. Francis B. Hayes for a Himalayan Rhododendron, ... 6 00
CYCLAMENS.—Ten plants in bloom, Thomas Clark, ... 10 00
Three plants in bloom, Kenneth Finlayson, gardener to Dr. C. G. Weld, ... 3 00
Second, Nathaniel T. Kidder, ... 2 00
Single plant in bloom, Kenneth Finlayson, ... 2 00
HEATHS OR EPACRISES.—Four plants, the second prize to Kenneth Finlayson, ... 6 00
HARDY PRIMROSES AND POLANTHUSES.—Ten plants, of distinct varieties, in bloom, Edwin Fewkes & Son, ... 5 00
Second, Nathaniel T. Kidder, ... 4 00
CINERARIAS.—Six varieties in bloom, in not over nine-inch pots, Nathaniel T. Kidder, ... 10 00
Second, Thomas Clark, ... 8 00
Third, Thomas Clark, ... 6 00
Single plant in bloom, Thomas Clark, ... 3 00
Second, Thomas Clark, ... 2 00
VIOLETS.—Six pots, in bloom, Nathaniel T. Kidder, . . . 4 00
Second, Thomas Clark, ... 3 00
Third, Nathaniel T. Kidder, ... 2 00
PANSIES.—Six distinct varieties, in pots, in bloom, W. C. Ward, . 4 00
Second, W. C. Ward, ... 3 00

Fifty cut blooms in the Society's flat fruit dishes, Denys Zirngiebel, ... 4 00
Second, Joseph S. Fay, ... 3 00
Third, Denys Zirngiebel, ... 2 00
Carnations.—Display of cut blooms, with foliage, not less than six varieties, in vases, Frederick C. Fisher, ... 5 00
Second, E. Sheppard & Son, ... 4 00
Camellias.—Display of named varieties, cut flowers with foliage, not less than twelve blooms, of not less than six varieties, Mrs. Francis B. Hayes, ... 4 00
Centre Piece or Artistic Design.—The last day of the Exhibition, Norton Brothers, ... 20 00
Second, Mrs. A. D. Wood, ... 15 00

Spring Flowering Bulbs.

Hyacinths.—Twelve distinct named varieties in pots, one in each pot, in bloom, Nathaniel T. Kidder, ... 10 00
Second, Thomas Clark, ... 8 00
Third, Edwin Fewkes & Son, ... 6 00
Six distinct named varieties in pots, one in each pot, in bloom, Edwin Fewkes & Son, ... 6 00
Second, Nathaniel T. Kidder, ... 5 00
Third, Kenneth Finlayson, gardener to Dr. C. G. Weld, . . 4 00
Three distinct named varieties in pots, one in each pot, in bloom, Edwin Fewkes & Son, ... 4 00
Second, Thomas Clark, ... 3 00
Third, Nathaniel T. Kidder, ... 2 00
Single named bulb, in pot, in bloom, Edwin Fewkes & Son, . 2 00
Second, Thomas Clark, ... 1 00
Three pans, ten bulbs of one variety in each pan, Nathaniel T. Kidder, ... 10 00
Second, Kenneth Finlayson, ... 8 00
Third, Thomas Clark, ... 6 00
Two pans, ten bulbs of one variety in each pan, Nathaniel T. Kidder, ... 8 00
Second, Kenneth Finlayson, ... 6 00
Third, Thomas Clark, ... 5 00
Single pan, with ten bulbs of one variety, Kenneth Finlayson, . 5 00
Second, Nathaniel T. Kidder, ... 4 00
Third, Thomas Clark, ... 3 00
Tulips.—Six six-inch pots, five bulbs in each, in bloom, Edwin Fewkes & Son, ... 5 00
Second, Kenneth Finlayson, ... 4 00
Third, Thomas Clark, ... 3 00
Three six-inch pots, five bulbs in each, in bloom, Edwin Fewkes & Son, ... 4 00
Second, Edwin Fewkes & Son, ... 3 00

Three pans, ten bulbs of one variety in each pan, Edwin Fewkes & Son, ... 6 00
Second, Nathaniel T. Kidder, ... 5 00
Third, Thomas Clark, ... 4 00
Fourth, Nathaniel T. Kidder, ... 3 00
Polyanthus Narcissus.—Four seven-inch pots, three bulbs in each, in bloom, Thomas Clark, ... 6 00
Second, Thomas Clark, ... 4 00
Hardy Narcissus and Daffodils.—Twelve pots, not less than six varieties, Kenneth Finlayson, ... 10 00
Second, Thomas Clark, ... 8 00
Jonquils.—Four six-inch pots, six bulbs in each, in bloom, Thomas Clark, ... 3 00
General Display of Spring Bulbs.—All classes, Thomas Clark, 20 00
Second, Nathaniel T. Kidder, ... 18 00
Lilium Longiflorum or Harrisi.—Three pots, not exceeding ten inches, Kenneth Finlayson, ... 8 00
Lily of the Valley.—Six six-inch pots, in bloom, Nathaniel T. Kidder, ... 5 00
Anemones.—Three pots or pans, Thomas Clark, ... 4 00
Second, Thomas Clark, ... 3 00
Freesias.—Six pots, Thomas Clark, ... 5 00

Gratuities :—

John Simpkins, Roses, Merveille de Lyon, Baroness Rothschild, and Her Majesty, ... 10 00
Mrs. Francis B. Hayes, Cut Roses, Camellias, and Violets, . . 10 00
Thomas H. Meade, Roses, Bon Silene, ... 2 00
Norton Brothers, Roses, Papa Gontier, ... 2 00
Norton Brothers, Roses, Mme. de Watteville, ... 2 00
Mrs. Francis B. Hayes, Pot Roses, Rhododendrons, and Azalea, . 10 00
Benjamin Grey, *Cattleya Trianæ*, twenty-five varieties, . . . 10 00
Pitcher & Manda, Fifty bottles of Orchids, ... 5 00
Fisher Brothers & Co., *Primula obconica*, and Palms, . . . 8 00
John Irving, *Primula obconica*, Cinerarias, Deutzia, . . . 4 00
T. Rowland, gardener to Anna L. Moring, Six pots of Mignonette, 3 00
Botanic Garden, Herbaceous Native Plants, ... 10 00
A. W. Spencer, Display of Pot Plants, ... 5 00
Temple & Beard, Evergreens in tubs and pots, ... 10 00
Nathaniel T. Kidder, Broom and Furze, ... 2 00
Edwin Fewkes & Son, *Iris Susiana*, ... 1 00
E. Sheppard & Son, Cut Flowers, ... 1 00
Mrs. E. M. Gill, " " 1 00

April 6.

Gratuity :—

Mrs. Francis B. Hayes, Cut Roses, ... 2 00

April 13.

Gratuities :—

Mrs. Francis B. Hayes, Azalea Charmer, ... 2 00
Mrs. Francis B. Hayes, Cut Roses, including Oakmont, . . . 2 00
Mrs. E. M. Gill, Cut Flowers, ... 1 00

April 27.

Gratuity :—

Walter E. Coburn, Pansies, eight dishes, ... 2 00

May 4.

Gratuities :—

Mrs. Francis B. Hayes, Cut Flowers in variety, ... 2 00
Mrs. E. M. Gill, Pansies and Cut Flowers, ... 1 00
E. H. Hitchings, Wild Flowers, ... 1 00

MAY EXHIBITION.

May 11.

Pelargoniums.—Four named Show or Fancy varieties, in pots, in in bloom, Joseph H. White, ... 6 00
Six named Zonale varieties, in pots, in bloom, Thomas Clark, . 5 00
Indian Azalea.—Single specimen in pot, named, Nathaniel T. Kidder, ... 4 00
Second, Nathaniel T. Kidder, ... 3 00
Calceolarias.—Six varieties, in pots, Kenneth Finlayson, gardener to Dr. C. G. Weld, ... 6 00
Second, Nathaniel T. Kidder, ... 5 00
Single plant, Kenneth Finlayson, ... 2 00
Second, Kenneth Finlayson, ... 1 00
Tulips.—Twenty-four blooms, distinct named varieties, Kenneth Finlayson, ... 4 00
Basket of Flowers.—The second prize to Mrs. E. M. Gill, . . 5 00
Third, Mrs. A. D. Wood, ... 4 00
Pansies.—Fifty cut blooms in the Society's flat fruit dishes, Denys Zirngiebel, ... 4 00
Second, Denys Zirngiebel, ... 3 00
Third, J. S. Fay, ... 2 00

Gratuities :—

John L. Gardner, Six Orchids, ... 7 00
Mrs. A. D. Wood, Hydrangeas, etc., ... 5 00
Joseph H. White, Gloxinias, etc., ... 5 00
Mrs. Francis B. Hayes, Oakmont Roses and Cut Flowers, . . 3 00
Miss Anna C. Kenrick, Magnolias, ... 1 00

Walter E. Coburn, Cut Flowers, ... 2 00
Mrs. E. M. Gill, " " 1 00
Mrs. P. D. Richards, Wild Flowers, ... 2 00
E. H. Hitchings, " " 1 00

MAY 25.

Gratuities:—

H. H. Hunnewell, Display of Rhododendrons and Azaleas, . . 20 00
Mrs. Francis B. Hayes, Collection of Rhododendrons, Azaleas, Japan Maples, etc., ... 10 00
Joseph H. Woodford, Collection of Seedling Clematis, in ten dishes and four vases, ... 5 00
Frederick C. Fisher, Eight varieties of Carnation, ... 2 00
William C. Strong, *Azalea mollis*, ... 1 00
Mrs. E. M. Gill, Cut Flowers, ... 1 00
Mrs. P. D. Richards, Wild Flowers, ... 2 00
E. H. Hitchings, " " 1 00

RHODODENDRON SHOW.

JUNE 1.

H. H. Hunnewell Premiums.

RHODODENDRONS.—Twelve distinct hardy varieties, named, John L. Gardner, piece of plate, value, ... $25 00
Second, Mrs. Francis B. Hayes, piece of plate, value . . 20 00
Single truss of any tender variety, named, Joseph Clark, . . 1 00
HARDY AZALEAS.—From any or all classes, fifteen named varieties, one truss each, Mrs. Francis B. Hayes, ... 8 00
Second, Thomas C. Thurlow, ... 5 00
Twelve named varieties, one truss each, E. Shepperd & Son, . 4 00
Cluster of trusses, of one variety, Mrs. Francis B. Hayes, . . 2 00
Second, Mrs. Francis B. Hayes, ... 1 00

Society's Prizes.

GERMAN IRIS.—Six distinct varieties, one spike of each, Edwin Fewkes & Son, ... 3 00
Second, Edwin Fewkes & Son, ... 2 00
CLEMATIS.—Named varieties, display of cut blooms, with foliage, Joseph H. Woodford, ... 4 00
HARDY PYRETHRUMS.—Display, Joseph H. Woodford, . . . 3 00
Second, J. W. Manning, ... 2 00
HARDY FLOWERING TREES AND SHRUBS.—Largest and best collection, named, cut blooms, Nathaniel T. Kidder, . . . 6 00
NATIVE PLANTS.—Display of named species and varieties, one bottle of each, Mrs. P. D. Richards, ... 4 00
Second, Walter E. Coburn, ... 3 00

BASKET OF FLOWERS.—Miss Sarah W. Story, ... 5 00
Second, Mrs. E. M. Gill, ... 4 00
HERBACEOUS PLANTS.—Largest and best arranged collection, correctly named, J. W. Manning, ... 4 00
Second, Miss Sarah W. Story, ... 3 00

Gratuities:—

Mrs. Francis B. Hayes, Display of Rhododendrons, . . . 20 00
H. H. Hunnewell, " " " 20 00
Nathaniel T. Kidder, " " " 2 00
John L. Gardner, " " " 1 00
Joseph Clark, " " " 1 00
E. Sheppard & Son, " " " 1 00
J. W. Manning, Display of Hardy Azaleas, ... 2 00
Robert T. Jackson, German Iris, ... 3 00
J. W. Manning, " " 3 00
Edwin Fewkes & Son, English Iris, ... 1 00
Benjamin Grey, Nymphæas, ... 2 00
Mrs. E. M. Gill, Cut Flowers, ... 1 00
E. H. Hitchings, Native Plants, ... 2 00

JUNE 8.

Gratuities:—

Mrs. Francis B. Hayes, Display of Rhododendrons and Pæonies, . 5 00
John L. Gardner, Pæonies, seventeen varieties, ... 5 00
William C. Strong, " 3 00
Joseph H. Woodford, Pæonies, ... 2 00
Miss Ellen M. Harris, " 2 00
E. Sheppard & Son, Pæonies and Cut Flowers, ... 2 00
Dr. C. G. Weld, *Cattleya Sanderiana* and *Dendrobium Bensoni*, . 3 00
William H. Spooner, Roses, ... 2 00
Mrs. E. M. Gill, Cut Flowers, ... 2 00

JUNE 15.

Gratuities:—

Mrs. Francis B. Hayes, Roses, Kalmias, etc., ... 5 00
William H. Spooner, Roses, ... 3 00

ROSE EXHIBITION.

JUNE 18 AND 19.

Special Prize, Theodore Lyman Fund.

HARDY PERPETUAL ROSES.—Twenty-four distinct named varieties, three of each, the second prize to William H. Spooner, . $30 00
Third, Warren Heustis & Son, ... 25 00

Regular Prizes.

Twelve distinct named varieties, three of each, Mrs. Francis B. Hayes,	20 00
Second, William H. Spooner,	15 00
Third, Warren Heustis & Son,	10 00
Six distinct named varieties, three of each, the third prize to Joseph H. White,	8 00
Three distinct named varieties, three of each, Dr. C. G. Weld,	10 00
Second, Joseph H. White,	8 00
Twenty-four distinct named varieties, one of each, the second prize to William H. Spooner,	10 00
Eighteen distinct named varieties, one of each, the second prize to William H. Spooner,	8 00
Twelve distinct named varieties, one of each, John B. Moore & Son,	10 00
Second, Mrs. Francis B. Hayes,	6 00
Third, Warren Heustis & Son,	4 00
Six distinct named varieties, one of each, John B. Moore & Son,	6 00
Second, Joseph Clark,	4 00
Third, Mrs. Francis B. Hayes,	3 00
Three distinct named varieties, one of each, Mrs. Francis B. Hayes,	3 00
Second, John B. Moore & Son,	2 00
Third, Dr. C. G. Weld,	1 00
General Display of one hundred bottles of Hardy Roses, buds admissible, J. B. Moore & Son,	10 00
Second, Mrs. Francis B. Hayes,	9 00
Third, Mrs. E. M. Gill,	8 00
Fourth, John L. Gardner,	7 00
Fifth, William C. Strong,	6 00
Specimen Foliage or Flowering Plant.—New and rare, other than Orchid, John L. Gardner, *Gymnogramma Schizophyllum gloriosum*,	5 00
Orchids.—Six plants, of six named varieties, in bloom, John L. Gardner,	15 00
Second, E. W. Gilmore,	10 00
Three plants of three named varieties, in bloom, E. W. Gilmore,	8 00
Second, John L. Gardner,	6 00
Single specimen, named, John L. Gardner,	6 00
Second, E. W. Gilmore,	5 00
Herbaceous Pæonies.—Ten named varieties, O. B. Hadwen,	8 00
Sweet Williams.—Thirty trusses, not less than six distinct varieties, E. Sheppard & Son,	3 00
Second, Edwin Fewkes & Son,	2 00
Third, Joseph H. White,	1 00

VASE OF FLOWERS.—Best arranged, in one of the Society's glass vases, Mrs. E. M. Gill, ... 5 00
Second, Miss Sarah W. Story, ... 4 00
Third, Mrs. A. D. Wood, ... 3 00
HARDY GARDEN LILIES.—Collection, Thomas C. Thurlow, . . 5 00

Gratuities :—

Charles W. Galloupe, Eleven varieties of Tea Roses, . . . 10 00
John B. Moore & Son, Two stands of Roses, ... 7 00
Mrs. Francis B. Hayes, Hybrid Perpetual Roses, ... 4 00
John L. Gardner, " " " 3 00
John B. Moore & Son, " " " 2 00
Benjamin G. Smith, Roses, ... 2 00
O. B. Hadwen, " 2 00
Joseph Clark, " 1 00
William H. Spooner, Tea and Hybrid Tea Roses, open culture, . 2 00
Pitcher & Manda, Orchids, ... 25 00
John L. Gardner, Palms, etc., ... 25 00
E. W. Gilmore, Orchids, etc., ... 4 00
Mrs. E. M. Gill, Delphiniums, ... 2 00
J. B. Moore & Son, " 1 00
E. Sheppard & Son, " and Sweet Williams, . . . 3 00
John L. Gardner, " and Foxgloves, ... 3 00
Dr. C. G. Weld, " etc., ... 1 00
Miss Sarah W. Story, Sweet Williams, ... 1 00
William Patterson, Foxgloves, ... 2 00
William C. Winter, " Antirrhinums, and Sweet Williams, 1 00
Thomas C. Thurlow, Japan Iris, etc., ... 1 00
Edwin Fewkes & Son, English Iris, ... 1 00
John L. Gardner, " " 1 00
Joseph S. Chase, *Magnolia glauca*, ... 1 00
Mrs. P. D. Richards, Wild Flowers, ... 3 00
E. H. Hitchings, " " 1 00

JUNE 22.

Gratuity :—

Mrs. Francis B. Hayes, Hybrid Perpetual Roses, seventy varieties, 3 00

JUNE 29.

Gratuities :—

Mrs. Francis B. Hayes, Hybrid Perpetual Roses, ... 2 00
William C. Strong, Iris Kæmpferi, ... 5 00
John L. Gardner, " " 3 00
Edwin Fewkes & Son, " " Hand-Fertilized Seedlings, . 3 00
Edwin Sheppard & Son, Zonale Pelargoniums and other Cut Flowers, ... 2 00
Mrs. E. M. Gill, Cut Flowers, ... 1 00

July 6.

Hardy Carnations and Picotees.—Twelve cut blooms, distinct varieties, tree or tender kinds not admissible, Mrs. E. M. Gill, 3 00
Second, William C. Winter, ... 2 00
Third, William Patterson, ... 1 00
Basket of Flowers.—Mrs. E. M. Gill, ... 5 00
Second, Miss Sarah W. Story, ... 4 00
Third, Mrs. A. D. Wood, ... 3 00
Herbaceous Plants.—J. W. Manning, ... 4 00
Second, Miss Sarah W. Story, ... 3 00
Japan Iris (varieties of Iris Kæmpferi).—Best collection, in vases, William C. Strong, ... 8 00
Second, Edwin Fewkes & Son, ... 6 00
Six named varieties, in vases, Edwin Fewkes & Son, . . . 4 00
Second, William C. Strong, ... 3 00
Vase of Flowers.—Best arranged, in one of the Society's glass vases, Mrs. E. M. Gill, ... 4 00

Gratuities:—

Mrs. Francis B. Hayes, Lilies and Roses, ... 1 00
E. Sheppard & Son, Hollyhocks and Iris, ... 2 00
John Irving, Sweet Peas, ... 1 00
Joseph H. Woodford, Bouquet of Sweet Peas, ... 1 00
Mrs. E. S. Joyce, Cut Flowers, ... 1 00
Mrs. E. M. Gill, " " 1 00
Mrs. P. D. Richards, Wild Flowers, ... 2 00

July 13.

Hollyhocks.—Double, twelve blooms, on dishes, of twelve distinct colors, E. Sheppard & Son, ... 4 00
Second, Edwin Fewkes & Son, ... 3 00
Six blooms, of six distinct colors, on dishes, Joseph S. Fay, . 2 00
Second, Edwin Fewkes & Son, ... 1 00
Parlor Bouquets.—Miss Sarah W. Story, ... 4 00
Second, Joseph H. Woodford, ... 3 00
Third, Mrs. E. M. Gill, ... 2 00

Gratuities:—

Edwin Sheppard & Son, Hollyhocks, ... 4 00
Joseph S. Fay, " 3 00
Edwin Fewkes & Son, " 2 00
Mrs. E. M. Gill, " 1 00
Charles W. Galloupe, Roses, Pinks, etc., ... 2 00
Joseph H. White, Tuberous Begonias, ... 10 00
William C. Strong, Japan Iris, ... 2 00
Walter E. Coburn, Wild Flowers, ... 1 00

JULY 20.

Special Prize, offered by M. B. Faxon.

SWEET PEAS.—For the best Bouquet or Vase and best arranged, other foliage than that of sweet peas admissible, Joseph H. Woodford, ... 3 00

Regular Prizes.

GLOXINIAS.—Display of cut flowers, Joseph H. White, . . . 4 00
Second, Mrs. E. M. Gill, ... 3 00
NATIVE FERNS.—Best display, Severance Burrage, ... 4 00
Second, Mrs. P. D. Richards, ... 3 00
Third, Walter E. Coburn, ... 2 00

Gratuities:—

Charles W. Galloupe, Roses and Pinks, ... 2 00
James F. C. Hyde, Hollyhocks, ... 2 00
Caleb Bates, Sweet Peas, ... 1 00
Frederick S. Davis, Poppies, ... 1 00
William B. Atkinson, Tuberous Begonias, ... 1 00
Mrs. Francis B. Hayes, Cut Flowers, ... 3 00
Mrs. E. M. Gill, " " 2 00
Caleb Bates, Table Design, ... 1 00
Walter E. Coburn, Native Flowers, ... 1 00

JULY 27.

Special Prize, offered by M. B. Faxon.

SWEET PEAS.—For the best display, filling twenty-five of the Society's glass vases, William Patterson, ... 6 00

Regular Prizes.

VERBENAS.—Twenty vases, three trusses in each, the third prize to Charles W. Galloupe, ... 1 00
SWEET PEAS.—Display, filling thirty vases, James F. C. Hyde, . 6 00
Second, Mrs. E. M. Gill, ... 4 00
Third, Joseph H. White, ... 3 00
BASKET OF FLOWERS.—Miss Sarah W. Story, ... 4 00
Second, Mrs. E. M. Gill, ... 3 00
Third, Mrs. A. D. Wood, ... 2 00
HERBACEOUS PLANTS.—J. W. Manning, ... 4 00

Gratuities:—

Joseph H. Woodford, Bouquet of Sweet Peas, ... 1 00
Dr. H. E. Emery, Vase of Tritomas, ... 1 00

C. F. Tarbell, Twenty-four varieties of *Dianthus Chinensis*, and *D. Heddewigii*, and five varieties of The Bride, . . . 2 00
Mrs. E. M. Gill, *Lilium auratum macranthum*, ... 1 00
James W. Clark, Gladioli, ... 2 00
J. W. Manning, Phlox, ... 1 00
Charles W. Galloupe, Cut Flowers, ... 2 00
Dr. C. G. Weld, " " 2 00
Mrs. P. D. Richards, Wild Flowers, ... 3 00
Miss N. W. Nichols, " " 2 00
Walter E. Coburn, " " 1 00

August 3.

Perennial Phloxes.—Ten distinct named varieties, one spike each,
Edwin Fewkes & Son, ... 4 00
Second, E. Sheppard & Son, ... 3 00
Third, J. W. Manning, ... 2 00
Petunias.—Collection, filling thirty bottles, one spray each, the second prize to Mrs. E. M. Gill, ... 2 00
Vase of Flowers.—Mrs. E. M. Gill, ... 4 00
Second, Mrs. A. D. Wood, ... 3 00
Third, Miss Sarah W. Story, ... 2 00
Native Flowers.—Collection, Mrs. P. D. Richards, one hundred varieties, ... 4 00
Second, Severance Burrage, ninety varieties, ... 3 00
Third, Walter E. Coburn, sixty-five varieties, ... 2 00

Gratuities:—

H. H. Hunnewell, Orchids, Palms, etc., ... 20 00
J. Warren Clark, Gladioli, ... 5 00
Joseph H. White, Gloxinias, ... 3 00
William Patterson, " etc., ... 2 00
James F. C. Hyde, Hollyhocks, ... 1 00
E. Sheppard & Son, Phloxes, ... 1 00
Charles W. Galloupe, Cut Flowers, ... 1 00
Mrs. E. M. Gill, " " 1 00

August 10.

Gladioli.—Twenty named varieties, in spikes, J. Warren Clark, . 6 00
Single spike, J. Warren Clark, ... 1 00
Phlox Drummondi.—Thirty vases, not less than six varieties,
L. W. Goodell, ... 3 00
Second, Dr. C. G. Weld, ... 2 00
Third, William Patterson, ... 1 00

Gratuities:—

William E. Endicott, Gladioli, ... 1 00
Dr. C. G. Weld, *Phlox Drummondi*, ... 1 00

William Patterson, *Dianthus Heddewigii*, ... 1 00
Robert Petremant, Tuberous Begonias, thirty-nine varieties, . . 1 00
William C. Winter, Show, Cactus, and Pompon Dahlias, . . 2 00
George S. Tuttle, Pompon Dahlias, ... 2 00
Mrs. Starks Whiton, Dahlias, ... 1 00
L. W. Goodell, Fairy Blush Poppies and Japan Lotus, . . . 1 00
Edwin S. Hill, Petunias, ... 1 00
Mrs. Francis B. Hayes, Cut Flowers, ... 3 00
Mrs. E. M. Gill, " " 2 00
Nathaniel T. Kidder, " " 2 00
John Parker, " " 1 00
Mrs. A. D. Wood, " " 1 00
Mrs. P. D. Richards, Wild Flowers, ... 2 00

August 17.

Asters.—Victoria Flowered, thirty blooms, not less than twelve varieties, Nathaniel T. Kidder, ... 5 00
Basket of Flowers.—Best arranged, Mrs. E. M. Gill, . . 4 00
Second, Mrs. A. D. Wood, ... 3 00
Third, Miss Sarah W. Story, ... 2 00

Gratuities:—

Nathaniel T. Kidder, Collection of Asters, ... 2 00
Fearing Burr, " " 2 00
Joseph S. Fay, Asters, ... 2 00
J. Warren Clark, Gladioli, Lilies, and Euphorbia, ... 4 00
Benjamin D. Hill, Hardy Lilies, ... 3 00
Daniel Duffley, *Amaryllis Belladonna*, ... 2 00
George S. Tuttle, Liliputian Dahlias, ... 2 00
Edwin Fewkes & Son, " 2 00
Temple & Beard, " 1 00
John Parker, Dahlias, etc, ... 1 00
James F. C. Hyde, Hibiscus, ... 1 00
Mrs. E. M. Gill, Cut Flowers, ... 1 00
Mrs. A. D. Wood, " 1 00
Edwin S. Hill, " 1 00
Severance Burrage, Wild Flowers, ... 2 00
Mrs. P. D. Richards, " " 2 00
E. H. Hitchings, " " 1 00

August 24.

Special Prize, offered by M. B. Faxon.

Asters.—For the best display, filling twenty-five of the Society's glass vases, Joseph H. White, ... 4 00

Regular Prizes.

HARDY GARDEN LILIES.—Collection, the second prize to Benjamin D. Hill, ... 4 00
TROPÆOLUMS.—Display, filling twenty-five vases, Mrs. E. M. Gill, 3 00
Second, Dr. C. G. Weld, ... 2 00
Third, Benjamin D. Hill, ... 1 00
LILIPUTIAN DAHLIAS.—Twenty vases, George S. Tuttle, . . 4 00

Gratuities:—

William Patterson, Asters, ... 3 00
J. Warren Clark, Gladioli, ... 2 00
George S. Tuttle, Liliputian Dahlias, ... 2 00
Edwin Fewkes & Son, Dahlias, ... 2 00
Edwin S. Hill, Petunias, ... 1 00
Miss Sarah W. Story, Vase of Flowers, ... 2 00
Mrs. Francis B. Hayes, Cut Flowers, ... 2 00
Mrs. E. M. Gill " " 1 00
John Parker, " " 1 00
Walter E. Coburn, Wild Flowers, ... 1 00
Severance Burrage, " " 1 00
Mrs. P. D. Richards, " " 1 00

AUGUST 31.

Special Prize, offered by M. B. Faxon.

TROPÆOLUMS.—Best display, filling not less than twenty-five of the Society's vases, Dr. C. G. Weld, ... 3 00

Regular Prizes.

DOUBLE ZINNIAS.—Twenty-five flowers, not less than six varieties, L. W. Goodell, ... 3 00
Second, Edwin Sheppard & Son, ... 2 00
Third, Mrs. E. M. Gill, ... 1 00
DIANTHUS.—Collection of Annual and Biennial varieties, filling fifty bottles, L. W. Goodell, ... 4 00
Second, William Patterson, ... 3 00
Third, E. Sheppard & Son, ... 2 00
HERBACEOUS PLANTS.—J. W. Manning, ... 4 00

Gratuities:—

H. B. Watt, Tropæolums, ... 1 00
R. & J. Farquhar & Co., Asters, one hundred and fifty-six varieties, 5 00
William Patterson, Asters, ... 1 00
George S. Tuttle, Liliputian Dahlias, ... 2 00
Edwin Fewkes & Son, Dahlias, ... 1 00
L. W. Goodell, Cut Flowers, ... 2 00

Charles W. Galloupe, Cut Flowers, ... 1 00
E. Shephard & Son, " " 1 00
Mrs. E. M. Gill, " " 1 00
Mrs. A. D. Wood, " " 1 00
John Parker, " " 1 00
William Patterson, " " 1 00
Mrs. P. D. Richards, Wild Flowers, ... 2 00
Walter E. Coburn, " " 1 00

ANNUAL EXHIBITION.

SEPTEMBER 17, 18, 19, AND 20.

Hunnewell Premiums.

NEW EVERGREEN TREES AND SHRUBS AND HARDY RHODODENDRONS.—Display in pots, William C. Strong, ... $15 00

Society's Prizes.

GREENHOUSE PLANTS.—Six greenhouse and stove plants, of different named varieties, two Crotons admissible, Thomas Clark, 30 00
Second, Nathaniel T. Kidder, ... 25 00
Third, Joseph H. White, ... 20 00
Single plant for table decoration, dressed at the base, Nathaniel T. Kidder, ... 10 00
Second, Joseph H. White, ... 8 00
Third, Mrs. A. D. Wood, ... 6 00
SPECIMEN FLOWERING PLANT.—Single named variety, Joseph H. White, ... 6 00
Second, John L. Gardner, ... 5 00
VARIEGATED LEAVED PLANTS.—Six named varieties, not offered in the collection of greenhouse plants, Crotons and Dracænas not admissible, Nathaniel T. Kidder, ... 20 00
Second, Joseph H. White, ... 15 00
Single specimen, variegated, named, not offered in any collection, Nathaniel T. Kidder, ... 6 00
Second, Nathaniel T. Kidder, ... 5 00
Third, Thomas Clark, ... 4 00
GALADIUMS.—Four named varieties, Joseph H. White, . . . 5 00
FERNS.—Six named varieties, no Adiantums admissible, Nathaniel T. Kidder, ... 10 00
ADIANTUMS.—Five named varieties, Nathaniel T. Kidder, . . 8 00
Second, Dr. C. G. Weld, ... 5 00
TREE FERN.—Single specimen, named, Dr. C. G. Weld, . . 6 00
Third, Joseph H. White, ... 4 00
LYCOPODS.—Four named varieties, Nathaniel T. Kidder, . . 4 00
Second, Nathaniel T. Kidder, ... 3 00

Dracænas.—Six named varieties, Nathaniel T. Kidder, ... 6 00
Second, John L. Gardner, ... 5 00
Third, Joseph H. White, ... 4 00
Crotons.—Six named varieties, Thomas Clark, ... 8 00
Second, Nathaniel T. Kidder, ... 6 00
Palm or Cycad.—Single plant, named, Joseph H. White, Cycad, 8 00
Second, Joseph H. White, Palm, ... 6 00
Third, William E. Doyle, Cycad, ... 5 00
Orchids.—Six plants, named varieties in bloom, Nathaniel T. Kidder, ... 12 00
Three plants, named varieties, in bloom, John L. Gardner, . 8 00

Cut Flowers.

Special Prize offered by M. B. Faxon.

Single Dahlias.—For the best vase and best kept during the exhibition, raised from seed as an annual, Mrs. E. M. Gill, . 3 00

Regular Prizes.

Dahlias.—To be examined by the Committee each day of the exhibition; the prizes to be awarded on the second day.
Twelve named varieties, John Parker, ... 4 00
Liliputian Dahlias.—General Display, with buds and foliage, filling twenty-five bottles, George S. Tuttle, ... 5 00
Second, Franklin Bacheller, ... 4 00
Third, William C. Winter, ... 3 00
Basket of Flowers.—To be awarded on the second day of the exhibition, Mrs. E. M. Gill, ... 5 00
Second, Mrs. A. D. Wood, ... 4 00
Third, Miss Sarah W. Story, ... 3 00
Vase of Flowers.—To be awarded on the third day of the exhibition, Miss Sarah W. Story, ... 5 00
Second, Mrs. A. D. Wood, ... 4 00
Third, Mrs. E. M. Gill, ... 3 00
Table Design.—To be awarded on the last day of the exhibition, Mrs. A. D. Wood, ... 8 00
Second, Mrs. E. M. Gill, ... 6 00
Third, Miss Sarah W. Story, ... 5 00

Gratuities:—

William E. Doyle, Display of plants, centre of the hall . . . 30 00
William E. Doyle, " " " on the platform, . . . 20 00
H. H. Hunnewell, " " " 10 00
Nathaniel T. Kidder, " " " 5 00
Dr. C. G. Weld, " " " 5 00
Fisher Brothers & Co., Stand of Plants, ... 5 00

Benjamin Grey, Table of Plants and Water Lilies, . . . 5 00
H. H. Hunnewell, Water Lilies, ... 5 00
L. W. Goodell, " " 5 00
William C. Strong, Cut Foliage and Flowering Shrubs and Trees, . 5 00
Charles W. Galloupe, Vase of Roses, ... 3 00
James F. Marble, Liliputian Dahlias, ... 3 00
William C. Winter, Dahlias, ... 2 00
John Parker, " 2 00
George S. Tuttle, " 2 00
Macey Randall, " 2 00
Temple & Beard, " 1 00
H. H. Hunnewell, Tuberous Begonias and Cut Flowers, . . . 3 00
Joseph Clark, Two Vases of Anemones and Chrysanthemums, . 1 00
Mrs. E. M. Gill, Cut Flowers, ... 2 00
James F. C. Hyde, Asters, native and hybrid, ... 3 00
George Hollis, Asters, native, ... 1 00
Mrs. P. D. Richards, Wild Flowers, ... 3 00

October 19.

Gratuity :—

Mrs. Anna L. Moring, Chrysanthemums, seven varieties, . . 2 00

CHRYSANTHEMUM SHOW.

November 12, 13, and 14.

Special Prize, from the Josiah Bradlee Fund.

Fifty blooms, viz., thirty Japanese, ten Chinese, and ten Anemone,
Edwin Fewkes & Son, the Bradlee plate, value . . . 25 00

Society's Special Prizes.

Best Seedling of 1889, John Simpkins, for Sandyside, . Silver Medal
Second, Edwin Fewkes & Son, for Waban, ... 5 00
Third, George Hollis, for Aureole, ... 4 00

Regular Prizes.

Chrysanthemums.—Display of twenty named plants, all classes,
distinct varieties, Walter Hunnewell, ... 60 00
Second, E. W. Wood, ... 50 00
Third, Mrs. Francis B. Hayes, ... 40 00
Display of twelve named plants, all classes, distinct varieties,
Mrs. Francis B. Hayes, ... 40 00
Second, E. W. Wood, ... 30 00
Third, Joseph H. White, ... 20 00
Six incurved or Chinese, distinct named varieties, Henry P. Walcott, ... 20 00
Six Japanese, distinct named varieties, Henry P. Walcott, . . 20 00
Second, E. W. Wood, ... 15 00
Third, Joseph H. White, ... 10 00

Four Pompon, distinct named varieties, the second prize, to E. W. Wood,	8 00
Six plants, Japanese, in not over eight-inch pots, distinct named varieties, bearing not more than four blooms each, Dr. C. G. Weld,	10 00
Second, Charles J. Dawson,	8 00
Specimen Incurved or Chinese, named variety, Henry L. Higginson,	6 00
Second, Mrs. Francis B. Hayes,	5 00
Third, Edwin Fewkes & Son,	4 00
Specimen Japanese, named variety, Henry L. Higginson, Snow Storm,	6 00
Second, Henry P. Walcott,	5 00
Third, E. W. Wood,	4 00
Specimen Pompon, named variety, Henry P. Walcott,	5 00
Second, E. W. Wood,	4 00
Specimen Anemone, named variety, Henry L. Higginson,	6 00
Second, Mrs. Francis B. Hayes,	5 00
Third, E. W. Wood,	4 00
Specimen trained Standard, any class, named, Dr. C. G. Weld,	8 00
Second, Col. W. H. Forbes,	6 00
Third, Dr. C. G. Weld,	5 00
Twelve cut blooms, Large Flowered or Chinese, named, in vases, Joseph P. Melley,	6 00
Twelve cut blooms, Japanese, named, in vases, John Simpkins,	6 00
Second, Joseph H. White,	5 00
Third, Elijah A. Wood,	4 00
Six cut blooms, Large Flowered or Chinese, in vases, Elijah A. Wood,	4 00
Six cut blooms, Japanese, named, in vases, John Simpkins,	4 00
Second, John Simpkins,	3 00
Third, Joseph H. White,	2 00
Display of cut blooms, of all classes, filling fifty bottles, E. Fewkes & Son,	12 00
Second, Mrs. Francis B. Hayes,	10 00
Third, Mrs. E. M. Gill,	8 00
Fourth, Dr. C. G. Weld,	6 00
Fifth, Edwin Sheppard & Son,	4 00

Gratuities :—

Mrs. Francis B. Hayes, Display on the platform of Chrysanthemums in pots,	20 00
Charles J. Dawson, Chrysanthemums in pots,	15 00
Mrs. Francis B. Hayes, Chrysanthemums, ten plants, group in upper hall,	10 00
George B. Gill, Chrysanthemums, Nine seedling plants in pots,	4 00
Mrs. E. M. Gill, "	3 00
Mrs. E. M. Gill, " Display,	2 00

Galvin Brothers, Chrysanthemums, Twelve vases,	25 00
Edwin Fewkes & Son, Chrysanthemums, Five vases,	5 00
Mrs. A. D. Wood, Chrysanthemums, Three vases,	3 00
John Simpkins, Chrysanthemums in vases,	3 00
Jennie W. May, Chrysanthemums, Fifty bottles, open culture,	3 00
Mrs. Francis B. Hayes, Chrysanthemums, Grafted,	2 00
Pitcher & Manda, Chrysanthemums, Cut blooms,	3 00
George B. Gill, " "	1 00
George Hollis, "	2 00
Edwin Fewkes & Son, "	1 00
Joseph H. White, "	1 00
Norton Brothers, Orchids,	5 00
Mrs. Francis B. Hayes, Orchids, etc.,	2 00
Norton Brothers, Palm for Centre Table,	2 00
Charles W. Galloupe, Vase of Roses,	2 00
R. T. Lombard, Carnations,	1 00
Frederick C. Fisher, Carnations, eleven varieties,	1 00
T. Rowland, Case of Growing Mushrooms,	2 00

APPLETON SILVER MEDAL.

J. W. Manning, Best Collection of Herbaceous Plants exhibited at the stated times during the season, as specified in the Schedule.

SOCIETY'S SILVER MEDALS.

Annual Exhibition, September 17–20. H. H. Hunnewell, Dracænas.
October 5. John L. Gardner, *Vanda Kimballiana.*
Chrysanthemum Show, November 12–14. John Simpkins, Seedling Chrysanthemum, 1889, Sandyside.

FIRST CLASS CERTIFICATES OF MERIT.

February 23. Pitcher & Manda, *Cattleya Trianæ* var. *Smithæ.*
March 2. Thomas W. Dee, Superior cultivation of *Lilium Harrisi.*
" 9. Fisher Brothers, Superior cultivation of Cyclamen.
" 9. Mrs. Francis B. Hayes, Seedling Hardy Rhododendron, Mrs. Cleveland, entered for Prospective Prize.
Spring Exhibition, March 27–29. T. Rowland, Gardener to Mrs. Anna L. Moring, Superior cultivation of Mignonette.
" " " " C. Strauss & Co., Rose, Souvenir de Wootton.
Rhododendron Show, June 1. Joseph H. Woodford, Seedling Double Clematis.
" " " " Robert T. Jackson, Seedling German Iris.
" " " " Thomas C. Thurlow, Seedling Ghent Azaleas.

June 8. Joseph H. Woodford, Clematis.
Rose Exhibition, June 18, 19. Sewall Fisher, White Carnation, Mrs. Fisher.
July 27. Pitcher & Manda, New *Achillea serrata*, The Pearl.
August 31. Jackson Dawson, *Symplocos paniculatus.*
October 19. John Simpkins, Seedling Chrysanthemum, Miss R. Simpkins.
" 26. Charles M. Atkinson, Gardener to John L. Gardner, Superior cultivation of *Æschynanthus grandiflorus.*
Chrysanthemum Show, November 12–15. E. W. Gilmore, *Sophronitis coccinea grandiflora.*
December 14. Lothrop Wight, Seedling Carnation, Hector.
" " Pitcher & Manda, *Lælia autumnalis Fostermanni.*
" " " " *Lælia autumnalis alba.*

REPORT

OF THE

COMMITTEE ON FRUITS,

FOR THE YEAR 1889.

By E. W. WOOD, Chairman.

While the fruits of New England suffer more or less from drought in the average of years, the past year has been exceptional in this respect, and all the fruits have suffered from too much and too constant wet weather. The fine flavor for which our fruits are noted, the result of the usually bright and sunny days of late summer and early autumn, was wanting in our autumn and winter fruits. This was especially noticeable in pears.

The winter of 1888–89 was less severe than usual, and the fruit-bearing vines, shrubs, and trees suffered little or no injury, except strawberries, which, owing to the ground being bare almost constantly, unless well protected were badly injured. In some localities, beds which in the fall gave promise of an abundant crop, were found so badly winter-killed that the ground was ploughed and devoted to other crops. Of the beds that were comparatively uninjured, owing to some cause, apparently the cold storms that prevailed while the plants were in bloom, a portion blasted, and few if any beds produced full crops.

No new strawberries have appeared during the past year that are superior to those already in general cultivation. Among the growers for market, the Belmont, Jewell, and Sharpless, still

have the preference. They are all strong growing and large fruited varieties, and their fruit commands the highest price in market. The Bubach and Jessie were shown at our exhibitions; they are both of large size but have not been sufficiently grown in this vicinity for the Committee to judge of their desirability for general cultivation. The show of strawberries at the Rose and Strawberry Exhibition was fully up to the standard of past years, though a large number of the prizes offered were not awarded. It is unfortunate for the lovers of this fruit, that such varieties as La Constante, Wilder, Jucunda, and Hervey Davis, are so seldom on our tables.

The strawberry is constantly receiving, as it deserves, more attention from horticulturists, and from the increasing demand and other causes already mentioned, brought higher prices in market the past season than for many years.

The show of small fruits at the Summer exhibitions has been limited in quantity, with no improvement in quality over past years. The Cherry, a tree of sturdy growth, requiring comparatively little care or cultivation, seems to receive little attention from our exhibitors in proportion to its merits. The competition for prizes has constantly grown less for several years.

The Gooseberry is grown successfully by a limited number of our exhibitors, yet the finer foreign varieties mildew with most growers, so as to make them undesirable, and the native sorts, though grown more easily, have no established market value to make them desirable for cultivation.

There has been no marked improvement in the exhibits of the Raspberry. While this fruit is grown, as it deserves to be, in almost every private garden, it is hardly in sufficient quantity to pick, on the day of exhibition, the required amount of specimen berries, and the fact that the raspberry requires more care and time in growing, picking, and marketing, than the strawberry and some other fruits, and that it is more liable to loss during the winter, as none of the varieties have proved hardy, limits its cultivation for market in this vicinity.

The exhibits of Blackberries have been larger than usual, but there are the same objections to the general cultivation of the blackberry, as given above in relation to the raspberry, and they are not so generally grown in the private garden, as it is more

difficult to keep them in a limited space and owing to their tall, stiff, thorny canes it is not an easy or agreeable pastime to give them the needed winter protection.

The show of Plums has been less than for several years. Some half dozen exhibitors who, a few years since, set out collections of plum trees, including the most desirable varieties, made interesting and attractive exhibits of the fruits for three or four years, but most of the trees have fallen victims of that fatal disease, the black knot. There are hopeful indications that a remedy may soon be found for this disease, and if the efforts now being made prove successful, the plum will soon be found in every garden and will become a profitable orchard fruit.

The Peach buds were not as badly killed the past winter as in several recent years, but the wet weather was unfavorable, and an unusually large proportion of the fruit rotted before maturing. It requires more patient perseverance to grow a crop of peaches than any other of our tree fruits. It has been remarked by an experienced grower and most careful observer, that he has never seen a tree affected with the yellows, that had a sound trunk, the inference being, that the disease follows an injury, either by accident or borers, to the body of the tree.

It has been an exceptionally unfavorable season for the Grape. This fruit seldom suffers from drought; it requires a dry, warm soil and bright sun to secure its highest quality. In view of the fact that the grape is often injured, and not unfrequently destroyed, by early frosts, the practice of girdling the vines is every year receiving more attention from those interested in growing this fruit, as by this process the crop can be secured in suitable condition for market at least two weeks earlier than if allowed to ripen in the natural way. The fruit from girdled vines is larger and more attractive in appearance. But it has been the general belief that girdling the branch affected the quality of the fruit unfavorably, though there has been a difference of opinion on this point. In this connection some recent analyses, made at the Experiment Station at Amherst, are especially interesting. Arrangements were made with Dr. Fisher, of Fitchburg, to furnish fruit gathered at different times, from both girdled vines and those not girdled, and Professor Goessmann made the following report:

With fruit gathered September 20, the result was:

	From girdled vines.	From ungirdled vines.
Moisture,	83.00%	84.69%
Ash,	.42	—
Sugar,	8.13	6.24
Soda solution* required to neutralize acid	85.4 c. c.	75.0 c. c.

With fruit gathered October 1:

	From girdled vines.	From ungirdled vines.
Moisture,	82.69%	84.51%
Ash,	.37	.53
Sugar,	8.50	6.09
Soda solution* required to neutralize acid	50. c. c.	48. c. c.

In reference to the above analyses, Professor Maynard adds: "This is the same result as was obtained years ago in our experiments on the college grounds, and with Dr. Fisher's judgment as to the selection of fruit, and Dr. Goessmann's analysis, I feel that we can claim to have settled the question of quality of girdled and ungirdled grapes." Girdling in no way disfigures the vines, or requires any change in the present method of pruning and training, as the practice is to grow each year new canes for the following year's fruiting, and the girdling is confined to the fruiting canes, which are cut away clean at the end of the season, leaving no trace of the previous year's girdling.

It has been the off year for the apple crop, and as usual it has been small and more unevenly distributed than usual. Some parts of the State, notably a large portion of Worcester County, have had hardly any crop at all.

Pears have been unusually large and fair, especially some varieties, among which, the Seckel and Bosc were conspicuous. The display of fruit at the Annual Exhibition, as a whole, was good, though not so evenly distributed as usual, owing to the peculiarity of the season. In some classes it was small, while in others it was exceptionally large and fine in appearance.

At the October and November Exhibitions of Autumn and Winter fruits, there was a strong competition for the prizes for

*1 part Sodium Carbonate to 100 parts water.

pears, while, owing to the causes previously mentioned, the show of apples and grapes was limited. Last year, apple growers found it difficult to dispose of their crop, even at low prices. This year many of them are obliged to buy western fruit for home consumption, and at very much higher prices. As this is continually occurring it would seem to be an object with growers of this fruit to change the bearing year, and thus secure a more even distribution in successive years. This may be done on young orchards, with comparatively little labor.

There have not been as many new fruits shown the past year as usual, which may be owing to the fact that it has been an unfavorable season to test the quality of all kinds of fruits.

Of the $1,700 appropriated for prizes and gratuities for fruits, $1,562 have been awarded, leaving an unexpended balance of $138.

Although the highest hopes and anticipations of the fruit-growers may not have been fully realized, when their crops are compared with other agricultural products they have little cause for complaint.

The Committee recommend that the Society award the Prospective prize for the best Seedling Strawberry to Warren Heustis for his seedling, Belmont.

E. W. Wood,
C. F. Curtis,
Samuel Hartwell,
Benjamin G. Smith,
Jacob W. Manning,
Warren Fenno,

Fruit Committee.

PRIZES AND GRATUITIES AWARDED FOR FRUITS.

SPRING EXHIBITION.

March 27, 28, and 29.

Winter Apples.—Any variety, George C. Rice, Tompkins King,	$3 00
Second, Calvin Terry,	2 00
Winter Pears.—Any variety, Warren Fenno, Duchess of Bordeaux,	3 00
Second, M. W. Chadbourne, Vicar,	2 00
Strawberries.—One pint, Oak Grove Farm,	3 00

Gratuities: —

Winter Brothers, Foreign Grapes,	2 00
O. P. Rook, Gardenia, Florida, Collection of Citrous Fruits, First Class Certificate of Merit.	

April 6.

Gratuity:—

Winter Brothers, Foreign Grapes,	2 00

May 4.

Gratuity: —

Calvin Terry, Hunt Russet Apples,	1 00

June 1.

Gratuities: —

Winter Brothers, Foreign Grapes,	3 00
William Brown, Peaches,	1 00
Frederick C. Fisher, Crescent Strawberries,	1 00
Leonard W. Weston, " "	1 00

June 8.

Gratuities:—

George Hill, Jewell, Jessie, and Sharpless Strawberries,	2 00
William G. Prescott, Sucker State, Bubach, and Jewell Strawberries,	1 00
William Doran & Son, Charles Downing and Sharpless Strawberries,	1 00

June 15.

Gratuity: —

Charles E. Grant, Jessie, Downing, and Bubach Strawberries,	1 00

ROSE AND STRAWBERRY EXHIBITION.

JUNE 18 AND 19.

Special Prizes from the Theodore Lyman Fund.

STRAWBERRIES.—For the best four quarts of any variety, Samuel Barnard, Sharpless, the Lyman Plate, value	$20 00
Second, Samuel Barnard, Belmont, the Lyman Plate, value	12 00
Third, Warren Heustis & Son, Belmont, the Lyman Plate, value	8 00

Special Prizes offered by the Society.

STRAWBERRIES —For the best two quarts of any variety Thomas C. Thurlow, Prince of Berries,	8 00
Second, Warren Heustis & Son, Belmont,	6 00
Third, Isaac E. Coburn, Belmont,	4 00
Fourth, Samuel Barnard, Miner's Prolific,	3 00
For the best exhibition of a seedling Strawberry introduced within the last five years, and never having taken a prize, Stephen Hoyt & Son, Yale, Silver Medal.	

Regular Prizes.

For the largest and best collection, not less than twenty baskets, of two quarts each, and not less than five varieties, Samuel Barnard,	25 00
Ten baskets of one variety, two quarts each, Samuel Barnard, Sharpless,	15 00
Second, Warren Heustis & Son, Belmont,	10 00
Third, William Doran & Son, Sharpless,	5 00
Five baskets of one variety, two quarts of each, Samuel Barnard, Champion,	8 00
Second, Isaac E. Coburn, Belmont,	6 00
Two quarts of Belmont, Samuel Barnard,	4 00
Second, George V. Fletcher,	3 00
Third, William Patterson,	2 00
Bidwell, Isaac E. Coburn,	4 00
Champion, Samuel Barnard,	4 00
Second, Leonard W. Weston,	3 00
Third, J. Henry Fletcher,	2 00
Charles Downing, Charles E. Grant,	4 00
Second, Isaac E. Coburn,	3 00
Third, William Doran & Son,	2 00
Crescent, Leonard W. Weston,	4 00
Second, Winter Brothers,	3 00
Cumberland, Winter Brothers,	4 00
Jewell, Samuel Barnard,	4 00
Second, George V. Fletcher,	3 00
Third, Isaac E. Coburn,	2 00

Jucunda, Charles F. Curtis, ... 4 00
Miner's Prolific, Samuel Barnard, ... 4 00
Second, Oliver R. Robbins, ... 3 00
Third, Isaac E. Coburn, ... 2 00
Sharpless, Samuel Barnard, ... 4 00
Second, George V. Fletcher, ... 3 00
Wilder, Winter Brothers, ... 4 00
Two quarts of any other variety, Isaac E. Coburn, Jessie, . . 4 00
Second, Leonard W. Weston, Bomba, ... 3 00
Third, Winter Brothers, Kenny's No. 10, ... 2 00
Collection of not less than six varieties, one quart each, Samuel Barnard, ... 8 00
Second, Isaac E. Coburn, ... 6 00
One quart of any new variety, not previously exhibited, Winter Brothers, Henderson, ... 3 00
Benjamin G. Smith, Louise, ... 2 00
Cherries.—Two quarts of any variety, Edwin Hastings, Knight's Early Black, ... 4 00
Second, George V. Fletcher, Early Purple Guigne, . . . 3 00
Third, George V. Fletcher, Governor Wood, ... 2 00
Foreign Grapes.—Two bunches of any variety, Winter Brothers, Black Hamburg, ... 6 00
Second, Winter Brothers, Muscat of Alexandria, . . . 4 00
Forced Peaches.—Six specimens of any variety, Winter Brothers, Amsden's June, ... 3 00
Second, Winter Brothers, Waterloo, ... 2 00

June 29.

Gratuities:—

William Doran & Son, Currants and Raspberries, ... 1 00
Charles N. Brackett, Cherries, ... 1 00
Leverett M. Chase, " 1 00

July 6 and 13.

Strawberries.—One quart of any variety, Winter Brothers, Gandy, ... 3 00
Cherries.—Two quarts of any other variety than Black Eagle, Black Tartarian, Coe's Transparent, or Downer's Late, Charles N. Brackett, Seedling, ... 3 00
Two quarts of any variety, Leverett M. Chase, ... 3 00
Second, George V. Fletcher, ... 2 00
Raspberries.—Two quarts of any variety, Mrs. Francis B. Hayes, Herstine, ... 3 00
Second, William Doran & Son, Hornet, ... 2 00
Third, Charles N. Brackett, Franconia, ... 1 00

CURRANTS.—Two quarts of any Red variety, William Doran & Son, Versaillaise, ... 4 00
Second, Winter Brothers, Fay's Prolific, ... 3 00
Third, Benjamin G. Smith, Fay's Prolific, ... 2 00
Two quarts of any White variety, Winter Brothers, White Grape, 3 00
Second, Benjamin G. Smith, French Transparent, . . . 2 00

Gratuities:—

Winter Brothers, Foreign Grapes, ... 4 00
Joseph H. Woodford, Gooseberries, ... 1 00

JULY 13.

RASPBERRIES. Collection of not less than four varieties, two quarts of each, William Doran & Son, ... 4 00
Two quarts of any variety, Charles E. Grant, ... 3 00
Second, William Doran & Son, ... 2 00
CURRANTS.—One quart of Versaillaise, William Doran & Son, . 2 00
Second, Benjamin G. Smith, ... 1 00
One quart of any Red variety, Benjamin G. Smith, Fay's Prolific, 2 00
One quart of any White variety, Aaron S. McIntosh, Dana's Transparent, ... 2 00
Second, Benjamin G. Smith, French Transparent, . . . 1 00

Gratuities:—

Joseph H. Woodford, Raspberries, ... 1 00
Mrs. E. M. Gill, Currants and Raspberries, ... 1 00
Joseph S. Chase, Gooseberries, ... 1 00

JULY 20.

RASPBERRIES.—Two quarts of any variety, Charles N. Brackett, Cuthbert, ... 3 00
Second, Charles E. Grant, Cuthbert, ... 2 00
Third, William Doran & Son, Hornet, ... 1 00
CURRANTS.—One quart of any Red variety, William Doran & Son, Versaillaise, ... 3 00
Second, Winter Brothers, Fay's Prolific, ... 2 00
Third, Benjamin G. Smith, Versaillaise, ... 1 00
One quart of any White variety, Benjamin G. Smith, French Transparent, ... 2 00
Second, Winter Brothers, White Grape, ... 1 00
BLACKBERRIES.—Two quarts of any variety, Benjamin G. Smith, Wilson, Jr., ... 3 00
Second, Aaron S. McIntosh, Dorchester, ... 2 00
Third, Leonard W. Weston, " 1 00
GOOSEBERRIES.—Two quarts of any variety, Winter Brothers, Downing, ... 3 00
Second, Winter Brothers, Mountain Seedling, ... 2 00
Third, Benjamin G. Smith, Downing, ... 1 00

Gratuities:—

Charles N. Brackett, Pears and Apples, ... 1 00
Samuel Hartwell, Peaches, ... 1 00
Joseph White, " 1 00
Charles S. Smith, " 1 00
Benjamin G. Smith, Seedling Blueberries, ... 1 00

JULY 27.

BLACKBERRIES.—Two quarts of any variety, M. W. Chadbourne, Dorchester, ... 3 00
Second, Leonard W. Weston, Dorchester, ... 2 00
Third, Aaron S. McIntosh, " 1 00
GOOSEBERRIES.—Two quarts of Industry, Winter Brothers, . . 2 00
Two quarts of any other Foreign variety, Benjamin G. Smith, Bang-up, ... 2 00
Second, Winter Brothers, Whitesmith, ... 1 00
PEARS.—Summer Doyenne, Warren Fenno, ... 3 00
Second, Winter Brothers, ... 2 00
Third, Benjamin G. Smith, ... 1 00
Any other variety, William P. Walker, Giffard, ... 3 00
Second, Warren Heustis & Son, " 2 00
Third, Charles N. Brackett, " 1 00
PEACHES.—Any variety, Charles S. Smith, Alexander, . . . 3 00
Second, Samuel Hartwell, Waterloo, ... 2 00

AUGUST 3.

APPLES.—Sweet Bough, Warren Heustis & Son, ... 3 00
Second, George V. Fletcher, ... 2 00
Third, Warren Fenno, ... 1 00
Any other variety, Samuel G. Damon, Red Astrachan, . . 3 00
Second, Samuel Hartwell, Williams, ... 2 00
Third, M. W. Chadbourne, " 1 00
PEARS.—Giffard, Francis B. Snow, ... 3 00
Second, Warren Fenno, ... 2 00
Third, Warren Heustis & Son, ... 1 00
Any other variety, Aaron S. McIntosh, Clapp's Favorite, . . 3 00
Second, Edward B. Wilder, Suprême de Quimper, . . . 2 00
Third, Charles N. Brackett, Brandywine, ... 1 00
BLACKBERRIES.—Two quarts of any variety, M. W. Chadbourne, Dorchester, ... 3 00
Second, Aaron S. McIntosh, Dorchester, ... 2 00
Third, Leonard W. Weston, " 1 00

Gratuity:—

Joseph H. White, Peaches, ... 2 00

August 10.

Apples.—Oldenburg, William S. Janvrin, ... 3 00
Second, William T. Hall, ... 2 00
Red Astrachan, C. C. Shaw, Milford, N. H. 3 00
Second, William T. Hall, ... 2 00
Third, Samuel G. Damon, ... 1 00
Pears.—Clapp's Favorite, Horace Partridge, ... 3 00
Second, M. W. Chadbourne, ... 2 00
Third, Aaron S. McIntosh, ... 1 00
Manning's Elizabeth, Mrs. Mary Langmaid, ... 2 00
Second, Frank Ware, ... 1 00
Any other variety, Edward B. Wilder, Brandywine, . . . 2 00
Second, Charles N. Brackett, " 1 00
Peaches.—Twelve specimens, of out-door culture, of any variety, Nathan D. Harrington, Crawford's Early, ... 3 00
Second, Samuel Hartwell, Foster, ... 2 00
Third, Charles S. Smith, Crawford's Early, ... 1 00
Six specimens of cold house or pot culture, of any variety, Joseph H. White, Early Rivers, ... 3 00
Second, Joseph H. White, ... 2 00
Foreign Grapes.—Two bunches of any variety, Nathaniel T. Kidder, Black Hamburg, ... 5 00
Second, Joseph H. White, Alicante, ... 4 00

August 17.

Apples.—Williams's Favorite, Charles F. Curtis, ... 3 00
Second, P. G. Hanson, ... 2 00
Third, C. C. Shaw, ... 1 00
Pears.—Bartlett, Mrs. Mary Langmaid, ... 3 00
Second, Varnum Frost, ... 2 00
Third, Warren Heustis & Son, ... 1 00
Rostiezer, M. W. Chadbourne, ... 3 00
Second, Horace Partridge, ... 2 00
Third, Joshua T. Foster, ... 1 00
Tyson, Benjamin G. Smith, ... 3 00
Second, Warren Fenno, ... 2 00
Third, Aaron S. McIntosh, ... 1 00
Any other variety, Aaron S. McIntosh, Clapp's Favorite, . . 3 00
Second, Warren Heustis & Son, " " . . 2 00
Third, Samuel Hartwell, ... 1 00
Peaches.—Any variety, Elijah H. Luke, Crawford's Early, . . 3 00
Second, Charles S. Smith, " " . . 2 00
Third, Nathan D. Harrington, " " . . 1 00

August 24.

Apples.—Any variety, Warren S. Frost, Gravenstein, . . . 3 00
Second, Warren Fenno, Summer Pippin, ... 2 00
Third, Warren Heustis & Son, Gravenstein, ... 1 00

PEARS.—Bartlett, Mrs. Mary Langmaid, ... 3 00
Second, Varnum Frost, ... 2 00
Third, William P. Walker, ... 1 00
Any other variety, Leverett M. Chase, Clapp's Favorite, . . 3 00
Second, Aaron S. McIntosh, " " . . 2 00
Third, Warren Heustis & Son, " " . . 1 00
PEACHES.—Any variety, Elijah H. Luke, Crawford's Early, . . 3 00
Second, Samuel Hartwell, Foster, ... 2 00
Third, Nathan D. Harrington, Crawford's Early, . . . 1 00
PLUMS.—Any variety, Leverett M. Chase, Bradshaw, . . . 3 00
Second, William P. Walker, Jefferson, ... 2 00
Third, Benjamin G. Smith, Imperial Gage, ... 1 00
NATIVE GRAPES.—Any variety, Cephas H. Brackett, Moore's Early, ... 3 00
Second, Samuel Hartwell, Moore's Early, ... 2 00
Third, Samuel G. Damon, " " 1 00

AUGUST 31.

APPLES.—Foundling, Warren Fenno, ... 3 00
Gravenstein, Warren Heustis & Son, ... 3 00
Second, Artemas Frost, ... 2 00
Third, Warren S. Frost, ... 1 00
Maiden's Blush, Warren Fenno, ... 3 00
Porter, Samuel G. Damon, ... 2 00
Any other variety, Warren Fenno, Summer Pippin, . . . 3 00
Second, Samuel Hartwell, Pumpkin Sweet, ... 2 00
Third, Charles E. Grant, Fall Orange, ... 1 00
PEARS.—Andrews, Mrs. Mary Langmaid, ... 3 00
Second, Leverett M. Chase, ... 2 00
Third, C. B. Smith, ... 1 00
Boussock, Thomas M. Davis, ... 3 00
Second, Leverett M. Chase, ... 2 00
Third, Mrs. Mary Langmaid, ... 1 00
Any other variety, C. H. Johnson, Bartlett, ... 3 00
Second, Warren Heustis & Son, Bonne d'Ezée, . . . 2 00
Third, Samuel Hartwell, Souvenir du Congrès, . . . 1 00
PEACHES.—Collection, Charles S. Smith, ... 4 00
Second, Samuel Hartwell, ... 3 00
Third, C. H. Johnson, ... 2 00
PLUMS.—Collection, not less than four varieties, Benjamin G. Smith, 3 00
Any one variety, Benjamin G. Smith, Coe's Golden Drop, . . 2 00
Second, Benjamin G. Smith, Pond's Seedling, ... 1 00
NATIVE GRAPES.—Six bunches of Delaware, Cephas H. Brackett, 3 00
Second, Samuel Hartwell, ... 2 00
Cottage, William H. Hunt, ... 3 00
Second, Samuel Hartwell, ... 2 00

Moore's Early, Samuel Hartwell, ... 3 00
Second, Varnum Frost, ... 2 00
Worden, Samuel Hartwell, ... 3 00
Any other variety, William H. Hunt, August Rose, . . . 3 00
Second, Benjamin G. Smith, Lady, ... 2 00

SEPTEMBER 7.

Gratuity:—

James H. Clapp, Collection of Apples, ... 2 00

ANNUAL EXHIBITION.

SEPTEMBER 17, 18, 19, AND 20.

SPECIAL PRIZES.

Samuel Appleton Fund.

BALDWIN APPLES.—Best twelve, Christopher C. Shaw, . . . 5 00
HUBBARDSTON APPLES.—Best twelve, Warren S. Frost, . . . 5 00
BOSC PEARS.—Best twelve, William P. Walker, ... 5 00
SHELDON PEARS.—Best twelve, Mrs. Mary Langmaid, . . . 5 00

Benjamin V. French Fund.

GRAVENSTEIN APPLES.—Best twelve, Warren S. Frost, . . . 5 00
RHODE ISLAND GREENING APPLES.—Best twelve, Charles E. Grant, 5 00

Marshall P. Wilder Fund.

ANJOU PEARS.—Best twelve, Warren Fenno, ... 4 00
Second, Mrs. Mary Langmaid, ... 3 00
Third, George W. Hall, ... 2 00
Fourth, William P. Walker, ... 1 00
BARTLETT PEARS.—Best twelve, Mrs. Mary Langmaid, . . . 4 00
Second, Abraham M. Leavitt, ... 3 00
Third, Warren S. Frost, ... 2 00
Fourth, Leverett M. Chase, ... 1 00
CONCORD GRAPES.—Best six bunches, Arthur J. Bigelow, . . 3 00
Second, G. W. Goddard, ... 2 00
Third, Cephas H. Brackett, ... 1 00
MOORE'S EARLY GRAPES.—Best six bunches, Samuel Hartwell, . 3 00

Josiah Bradlee Fund.

FOREIGN BLACK GRAPES.—Heaviest and best ripened bunch, not less than six pounds, George McWilliam, Black Hamburg, 7 lbs. 2 oz., ... 10 00
FOREIGN WHITE GRAPE.—Heaviest and best ripened bunch, not less than six pounds, George McWilliam, Trebbiano, 9 lbs. 8 oz., ... 10 00

Special Prizes offered by the Society.

ANJOU PEARS.—Best twelve, William P. Walker, ... 5 00
BARTLETT PEARS.—Best twelve, Varnum Frost, ... 5 00
SECKEL PEARS.—Best twelve, A. D. Miller, ... 5 00
PEACHES.—Best twelve of any variety, Samuel Hartwell, Crawford's Late, ... 5 00
NATIVE GRAPES.—Best twelve bunches, any variety, Samuel Hartwell, Moore's Early, ... 5 00

Theodore Lyman Fund.

APPLES.—Baldwin, Reuben Handley, ... 4 00
Second, William H. Teele, ... 3 00
Third, C. C. Shaw, ... 2 00
Danvers Sweet, C. C. Shaw, ... 3 00
Second, Joshua T. Foster, ... 2 00
Third, Benjamin G. Smith, ... 1 00
Dutch Codlin, Warren Fenno, ... 2 00
Second, Aaron S. McIntosh, ... 1 00
Fall Orange, Reuben Handley, ... 3 00
Second Charles S. Smith, ... 2 00
Third, Charles E. Grant, ... 1 00
Fameuse, Artemas Frost, ... 3 00
Foundling, C. C. Shaw, ... 4 00
Second, Warren Fenno, ... 3 00
Golden Russet, Warren Fenno, ... 2 00
Gravenstein, Warren S. Frost, ... 4 00
Second, Warren Heustis & Son, ... 3 00
Third, William T. Hall, ... 2 00
Hubbardston, C. C. Shaw, ... 4 00
Second, Samuel Hartwell, ... 3 00
Third, Joshua T. Foster, ... 2 00
Hunt Russet, Samuel Hartwell, ... 3 00
Second, William H. Hunt, ... 2 00
Third, Benjamin G. Smith, ... 1 00
Lady's Sweet, Warren Fenno, ... 2 00
Leicester, O. B. Hadwen, ... 2 00
Maiden's Blush, Warren Fenno, ... 2 00
Mother, Warren Fenno, ... 3 00
Second, O. B. Hadwen, ... 2 00
Northern Spy, William T. Hall, ... 3 00
Second, Warren Fenno, ... 2 00
Third, G. W. Goddard, ... 1 00
Porter, Edward Hemmenway, ... 3 00
Second, A. S. McIntosh, ... 2 00
Third, C. C. Shaw, ... 1 00
Pumpkin Sweet, George W. Stevens, ... 2 00
Second, Samuel Hartwell, ... 1 00

Rhode Island Greening, Reuben Handley, ... 4 00
Second, Aaron S. McIntosh, ... 3 00
Third, George V. Fletcher, ... 2 00
Roxbury Russet, Cephas H. Brackett, ... 4 00
Second, William Christie, ... 3 00
Third, Warren Heustis & Son, ... 2 00
Tolman's Sweet, G. W. Goddard, ... 3 00
Second, Christopher C. Shaw, ... 2 00
Third, Joshua T. Foster, ... 1 00
Tompkins King, G. W. Goddard, ... 3 00
Second, Christopher C. Shaw, ... 2 00
Washington Royal or Palmer, Charles N. Brackett, . . . 2 00
Second, O. B. Hadwen, ... 1 00
Washington Strawberry, James H. Clapp, ... 2 00
Second, Miss Sarah W. Story, ... 1 00
Any other variety, Z. Breed, Granite Beauty, ... 3 00
Second, George V. Fletcher, Pound Sweet, ... 2 00
Third, G. W. Goddard, Ribbed Sweet, ... 1 00
Crab Apples.—Hyslop, Twenty-four specimens, Cephas H. Brackett, 2 00
Second, Artemas Frost, ... 1 00
Transcendent, Twenty-four specimens, George W. Stevens, . 2 00
Second, Warren Fenno, ... 1 00

Society's Prizes.

Pears.—Angouleme, Samuel G. Damon, ... 4 00
Second, Warren Fenno, ... 3 00
Third, A. H. Lewis, ... 2 00
Belle Lucrative, Abraham M. Leavitt, ... 3 00
Second, Warren Fenno, ... 2 00
Third, George W. Hall, ... 1 00
Bosc, Charles E. Curtis, ... 4 00
Second, Leverett M. Chase, ... 3 00
Third, Edward J. Coolidge, ... 2 00
Fourth, Warren Fenno, ... 1 00
Boussock, George W. Eaton, ... 3 00
Second, Thomas M. Davis, ... 2 00
Third, Leverett M. Chase, ... 1 00
Clairgeau, Warren Fenno, ... 3 00
Second, Willard P. Plimpton, ... 2 00
Third, Charles F. Curtis, ... 1 00
Comice, Warren Fenno, ... 3 00
Second, Leverett M. Chase, ... 2 00
Third, Charles N. Brackett, ... 1 00
Dana's Hovey, George Frost, ... 4 00
Second, Thomas M. Davis, ... 3 00
Third, Mrs. Mary Langmaid, ... 2 00

Diel, William P. Walker,	3 00
Second, Edwin A. Hall,	2 00
Third, Charles A. Smith,	1 00
Goodale, O. B. Hadwen,	1 00
Hardy, Warren Fenno,	3 00
Second, William P. Walker,	2 00
Third, Aaron S. McIntosh,	1 00
Howell, William P. Walker,	3 00
Second, Warren Fenno,	2 00
Third, E. W. Wood,	1 00
Lawrence, A. A. Johnson,	3 00
Second, Charles N. Brackett,	2 00
Third, William T. Hall,	1 00
Louise Bonne of Jersey, Thomas M. Davis,	3 00
Second, Charles E. Richardson,	2 00
Third, William P. Walker,	1 00
Marie Louise, Warren Fenno,	3 00
Second, Edwin A. Hall,	2 00
Merriam, Charles F. Curtis,	3 00
Second George S. Curtis,	2 00
Third, Samuel G. Damon,	1 00
Onondaga, Andrew McDermott,	3 00
Second, Thomas M. Davis,	2 00
Third, Charles A. Smith,	1 00
Paradise of Autumn, Leverett M. Chase,	3 00
Second, John L. Bird,	2 00
Third, Charles N. Brackett,	1 00
Seckel, A. D. Miller,	4 00
Second, James H. Clapp,	3 00
Third, Nathan D. Harrington,	2 00
Sheldon, Aaron S. McIntosh,	4 00
Second, Charles F. Curtis,	3 00
Third, Warren Fenno,	2 00
Souvenir du Congrès, Benjamin H. Ober,	3 00
Second, Joshua T. Foster,	2 00
Third, William T. Hall,	1 00
St. Michael Archangel, Thomas N. Davis,	3 00
Second, Warren Heustis & Son,	2 00
Third, Abraham M. Leavitt,	1 00
Superfin, Leverett M. Chase,	3 00
Second, E. W. Wood,	2 00
Third, Warren Fenno,	1 00
Urbaniste, Aaron S. McIntosh,	3 00
Second, M. W. Chadbourne,	2 00
Third, John L. Bird,	1 00
Vicar, Aaron S. McIntosh,	3 00
Second, Edwin A. Hall,	2 00
Third, Warren Fenno,	1 00

Winter Nelis, Thomas M. Davis,	3 00
Second, Edwin A. Hall,	2 00
Third, William P. Walker,	1 00
Any other variety, Warren Heustis & Son, Bonne d'Ezée,	3 00
Second, C. F. Weston, Fulton,	2 00
Third, Warren Fenno, Esperine,	1 00
Quinces.—Any variety, Benjamin G. Smith,	3 00
Second, George S. Curtis,	2 00
Third, George V. Fletcher,	1 00
Peaches.—Stump the World, Charles S. Smith,	2 00
Second, Samuel Hartwell,	1 00
Any other variety, G. W. Goddard, Excelsior,	3 00
Second, Samuel Hartwell, Crawford's Late,	2 00
Third, Warren Fenno, " "	1 00
Peaches.—Orchard House Culture, Charles E. Grant, Globe,	4 00
Plums.—Any one variety, Benjamin G. Smith, Coe's Golden Drop,	3 00
Native Grapes.—Six bunches of Brighton, Samuel G. Damon,	3 00
Second, Joseph S. Chase,	2 00
Third, Benjamin G. Smith,	1 00
Cottage, William H. Hunt,	3 00
Second, Samuel Hartwell,	2 00
Third, Benjamin G. Smith,	1 00
Delaware, Cephas H. Brackett,	3 00
Second, Samuel G. Damon,	2 00
Third, Joseph S. Chase,	1 00
Eumelan, Benjamin G. Smith,	3 00
Second, Samuel G. Damon,	2 00
Massasoit, Benjamin G. Smith,	3 00
Second, Joseph S. Chase,	2 00
Third, Samuel G. Damon,	1 00
Niagara, Samuel Hartwell,	3 00
Second, P. G. Hanson,	2 00
Wilder, Benjamin G. Smith,	3 00
Second, Samuel G. Damon,	2 00
Worden, Samuel Hartwell,	3 00
Second, G. W. Goddard,	2 00
Third, William Christie,	1 00
Any other variety, Samuel Hartwell, Hayes,	3 00
Second, Samuel Hartwell, Pocklington,	2 00
Third, P. G. Hanson, "	1 00
Foreign Grapes.—Four varieties, two bunches each, George McWilliam,	10 00
Second, Elijah H. Luke,	8 00
Third, Benjamin G. Smith,	6 00
Two bunches of Black Hamburg, Nathaniel T. Kidder,	5 00
Second, George McWilliam,	4 00
Third, John Simpkins,	3 00

Buckland Sweetwater, Nathaniel T. Kidder, ... 5 00
Muscat of Alexandria, John Simpkins, ... 5 00
Second, George McWilliam, ... 4 00
Wilmot's Hamburg, George McWilliam, ... 5 00
Any other variety, John Simpkins, Syrian, ... 5 00
Second, George McWilliam, Alicante, ... 4 00
Third, " " Trebbiano, ... 3 00

Gratuities:—

Warren Fenno, Collection of Apples, ... 1 00
H. Barker, " " Pears, ... 2 00
Aaron S. McIntosh, " " " 2 00
Edward B. Wilder, " " " 1 00
Charles N. Brackett, " " " 1 00
John B. Moore & Son, Eaton Grapes, ... 3 00
Marshall W. Chadbourne, Collection, ... 2 00
Charles E. Grant, " 1 00

EXHIBITION OF AUTUMN FRUITS.

October 5.

Apples.—Gravenstein, William T. Hall, ... 3 00
Second, Warren S. Frost, ... 2 00
Third, Warren Heustis & Son, ... 1 00
Fall Orange or Holden, Charles E. Grant, ... 3 00
Second, Charles S. Smith, ... 2 00
Mother, Warren Fenno, ... 3 00
Porter, Warren Heustis & Son, ... 3 00
Any other variety, William Winn, Tompkins King, . . . 3 00
Second, G. W. Goddard, " " 2 00
Pears.—Angouleme, Samuel G. Damon, ... 3 00
Second, Warren Fenno, ... 2 00
Third, A. H. Lewis, ... 1 00
Bosc, William P. Walker, ... 3 00
Second, C. A. Moore, ... 2 00
Third, Mrs. Mary Langmaid, ... 1 00
Clairgeau, William T. Hall, ... 3 00
Second, William P. Walker, ... 2 00
Third, Willard P. Plimpton, ... 1 00
Comice, John J. Merrill, ... 3 00
Second, Warren Fenno, ... 2 00
Third, Charles N. Brackett, ... 1 00
Louise Bonne of Jersey, Thomas M. Davis, ... 3 00
Second, Aaron S. McIntosh, ... 2 00
Seckel, Nathan D. Harrington, ... 3 00
Second, William Read, ... 2 00
Third, Aaron S. McIntosh, ... 1 00

Sheldon, Nathan D. Harrington,	3 00
Second, Warren Fenno,	2 00
Third, John J. Merrill,	1 00
Superfin, Thomas M. Davis,	3 00
Second, Warren Fenno,	2 00
Third, Charles A. Smith,	1 00
Urbaniste, A. D. Miller,	3 00
Second, A. S. McIntosh,	2 00
Third, E. J. Hewins,	1 00
Any other variety, S. F. & F. S. Weston, Columbia,	3 00
Second, " " " Fulton,	2 00
Third, A. A. Johnson, Lawrence,	1 00
Quinces.—Any variety, Benjamin G. Smith,	3 00
Second, Joseph S. Chase,	2 00
Third, Charles S. Smith,	1 00
Native Grapes.—Six bunches of Brighton, Samuel Hartwell,	3 00
Second, Samuel G. Damon,	2 00
Concord, G. W. Goddard,	3 00
Second, George W. Jameson,	2 00
Third, Samuel G. Damon,	1 00
Iona, Samuel G. Damon,	3 00
Second, Benjamin G. Smith,	2 00
Third, Joseph S. Chase,	1 00
Isabella, Samuel G. Stone,	3 00
Second, Benjamin G. Smith,	2 00
Lindley, Benjamin G. Smith,	3 00
Second, Samuel G. Damon,	2 00
Massasoit, Benjamin G. Smith,	3 00
Second, Samuel G. Damon,	2 00
Moore's Early, G. W. Goddard,	3 00
Second, Samuel Hartwell,	2 00
Pocklington, Samuel Hartwell,	3 00
Second, Benjamin G. Smith,	2 00
Third, Winter Brothers,	1 00
Prentiss, Benjamin G. Smith,	3 00
Wilder, Benjamin G. Smith,	3 00
Second, Samuel G. Damon,	2 00
Any other variety, G. W. Goddard, Worden,	3 00
Second, Samuel Hartwell, "	2 00
Third, Samuel Hartwell, Hayes,	1 00

Gratuities:—

Leverett M. Chase, Collection of Pears,	3 00
Jabez Fisher, " " Grapes,	3 00
Benjamin G. Smith, Grapes,	1 00
Calvin Terry, Cranberries,	1 00

EXHIBITION OF WINTER APPLES AND PEARS.

November 9.

Benjamin V. French Fund.

Baldwin Apples.—For the best twelve, Warren S. Frost, . . 5 00
Hubbardston Apples.—For the best twelve, Warren S. Frost, . 5 00

Society's Prizes.

Apples.—Baldwin, William H. Teele, ... 3 00
Second, Warren S. Frost, ... 2 00
Third, J. T. Foster, ... 1 00
Danvers Sweet, Warren Fenno, ... 3 00
Third, J. T. Foster, ... 1 00
Hubbardston, Warren S. Frost, ... 3 00
Second, J. T. Foster, ... 2 00
Third, Samuel Hartwell, ... 1 00
Hunt Russet, Starkes Whiton, ... 3 00
Second, A. S. McIntosh, ... 2 00
Third, Samuel Hartwell, ... 1 00
Lady's Sweet, Warren Fenno, ... 3 00
Second, William H. Teele, ... 2 00
Northern Spy, William T. Hall, ... 3 00
Second, Warren Fenno, ... 2 00
Third, Calvin Terry, ... 1 00
Rhode Island Greening, Warren Fenno, ... 3 00
Second, Richard T. Lombard, ... 2 00
Third, Charles E. Grant, ... 1 00
Roxbury Russet, Cephas H. Brackett, ... 3 00
Second, Warren Heustis & Son, ... 2 00
Third, Warren Fenno, ... 1 00
Tolman's Sweet, Joshua T. Foster, ... 3 00
Tompkin's King, William Winn, ... 3 00
Any other variety, John Fletcher, Fletcher Russet, . . . 3 00
Second, J. W. Wetherbee, " " . . . 2 00
Third, Warren Fenno, Rome Beauty, ... 1 00
Pears.—Angouleme, Samuel G. Damon, ... 4 00
Second, William T. Hall, ... 3 00
Third, Warren Fenno, ... 2 00
Fourth, Thomas M. Davis, ... 1 00
Anjou, William P. Walker, ... 4 00
Second, Leverett M. Chase, ... 3 00
Third, Warren Fenno, ... 2 00
Fourth, A. D. Miller, ... 1 00
Clairgeau, E. L. Wright, ... 3 00
Second, William T. Hall, ... 2 00
Third, William P. Walker, ... 1 00

Comice, Mrs. H. J. Merrill,	4 00
Second, Leverett M. Chase,	3 00
Third, Warren Fenno,	2 00
Fourth, Samuel G. Damon,	1 00
Dana's Hovey, Thomas M. Davis,	4 00
Second, Edwin A. Hall,	3 00
Third, Benjamin G. Smith,	2 00
Fourth, Warren Fenno,	1 00
Diel, C. A. Smith,	3 00
Second, Edwin A. Hall,	2 00
Third, Thomas M. Davis,	1 00
Glout Morceau, Augustus King,	3 00
Second, C. A. Smith,	2 00
Third, Edwin A. Hall,	1 00
Josephine of Malines, Warren Fenno,	3 00
Second, John L. Bird,	2 00
Third, Benjamin G. Smith,	1 00
Langelier, A. H. Lewis,	3 00
Second, Jacob Eaton,	2 00
Third, Thomas M. Davis,	1 00
Lawrence, A. A. Johnson,	3 00
Second, William T. Hall,	2 00
Third, Warren Fenno,	1 00
Vicar, C. A. Smith,	3 00
Second, William P. Walker,	2 00
Third, Edwin A. Hall,	1 00
Winter Nelis, Edwin A. Hall,	3 00
Second, Thomas M. Davis,	2 00
Third, Leverett M. Chase,	1 00
Any other variety, A. S. McIntosh, Urbaniste,	3 00
Second, M. W. Chadbourne, "	2 00
Third, A. S. McIntosh, Merriam,	1 00

Gratuities:—

C. C. Shaw, Apples,	2 00
G. W. Goddard, Apples,	2 00
Samuel G. Damon, Pears and Grapes,	2 00

REPORT

OF THE

COMMITTEE ON VEGETABLES,

FOR THE YEAR 1889.

By CHARLES N. BRACKETT, Chairman.

The past season has been a remarkable one. The early, severe, and prolonged rains, the cold and wet of midsummer, and the heavy and frequent storms during the season of harvest, have all conspired to make the season of 1889 one of great discouragement to farmer and horticulturist.

The unprecedented amount of rainfall throughout the entire growing season not only injured the quantity and quality of many crops, but made it next to impossible to do much of the farm work seasonably. If we may accept the reports of market gardeners in this vicinity as a criterion, the vegetable crops as a rule have been far from satisfactory.

Spring opened early. The month of May was unusually favorable for gardening operations generally, and all crops were in a more advanced state of growth at its close than is usual at this season of the year. One of the hottest days of the season occurred during this month, the temperature running up into the nineties, which had the effect of pushing vegetation ahead wonderfully. In fact the warm and favorable weather during this month, carried the season at least ten days ahead of the average, and fully a week in advance of the Schedule of Prizes, so that it was found necessary to hold the exhibitions of July 6 and 13 together on the 6th, and succeeding exhibitions a week earlier than the Schedule time, in order to bring the requirements of the Schedule and the advance in the season, more nearly together.

It was about this time that the unfavorable weather before mentioned set in, beginning with rain which continued with such short intervals that what promised to be an unusually favorable season proved the reverse. Crops which promised well earlier in the season, were on this account either partial or total failures.

The exhibitions of forced vegetables on January 5 and February 2, from some unknown cause, were not as good as usual. For the prizes for Tomatoes January 5, there was no competition, and none for Mushrooms February 2. The falling off in these exhibitions was more remarkable from the fact that heretofore at both these shows the number of contributors has been large and competition close.

May 4, Mrs. Francis B. Hayes showed three varieties of forced potatoes, the specimens of each being remarkably well grown and very fine. The varieties were Charles Downing, Lee's Favorite, and Bliss's Triumph, or Stray Beauty as it is sometimes called further south.

The first Peas of the season were shown by Cephas H. Brackett, June 1, which was from a week to ten days earlier than the average for several years. There has been such an advance made of late years, both in the quality and earliness of the wrinkled sorts, that it is hardly worth while to waste time in growing the little hard peas whose only recommendation is their earliness. The green, wrinkled varieties are sweeter and much finer flavored, and now follow them so closely that one can afford to wait a day or two longer and get a variety well worth eating.

At the Rose and Strawberry Show, June 18, the display of the various vegetable productions of the season was very full and complete, making it one of the best exhibitions in this department during the year. Competition was unusually brisk, and every prize offered was taken.

The Tomato crop, like many others this year, has been affected unfavorably by the unseasonable weather. The crop has consequently been a short one, and the fruit inferior in quality. The first exhibit of open culture was made July 13, when Cephas H. Brackett brought in the Dwarf Champion, a new variety introduced last year, and which comes up more nearly to the promise of the catalogue than new tomatoes generally do. The plants are stocky and compact in their growth, and will admit of much closer

planting than the common sorts. The foliage is distinct, with fruit not over large, but of fair size, remarkably smooth and solid, and, last but not least, it is one of the earliest varieties.

Not very many years ago the tomato was grown in this country only as an ornamental plant; today it is one of our most popular vegetables. It seemed to increase in popularity from the start, and the growing demand at the present time is astonishing. Through the aid of the canning factories our tables are kept supplied with this favorite vegetable during the entire year at reasonable prices. These establishments have multiplied so rapidly of late, throughout the country, that in seasons of over production and consequent low prices they become profitable channels through which the producer can dispose of his surplus crop. They are now practically indispensable to growers of both vegetables and fruits. They not only relieve the producer of his surplus, but also make special contracts with him to furnish them with the products of hundreds of acres of sweet corn, tomatoes, and other farm and garden vegetables, needed and used by them in this business. When we consider that a single establishment of this kind has contracted to have grown for them alone, upwards of three hundred acres of tomatoes annually, some idea of the magnitude of this industry may be gained.

At our Annual Exhibition there were fifty-seven dishes of tomatoes shown, mostly of fine specimens of all the leading varieties.

Among the novelties of recent introduction we notice as worthy of special mention, a new Bean introduced this season by Peter Henderson called the Bush Lima. One great objection to the old Lima bean has been, with many, that it can be grown only on poles, which are both unsightly and expensive. The new Bush Lima does away with this necessity, as it grows only about fifteen to eighteen inches in height, like any other bush bean. The only fault we have to find with it is the size of the bean itself. We think it would have been nearer the true thing to have named it a bush *Sieva*, as the beans are even smaller, if anything, than those of that variety. However, it must be considered a great acquisition, and will meet the wants of a large class, even should it prove too small to be profitably grown by the market gardener. It is a "break" in the right direction and opens up a wide field, the possibilities of which can hardly be estimated. The past

season was perhaps not very favorable for a fair test of this bean as regards earliness. It is claimed to be two weeks earlier than the old, large Lima. It was shown here August 17, by Charles E. Grant, and did not at that time appear quite fully grown, while the large Limas shown on the same date by Benjamin G. Smith and others, were in perfection.

The potato crop of the past season must be considered as decidedly poor, especially in this vicinity. The vines were again badly injured by blight, and the unpropitious weather during the growing season favored the spread of the disease, and served to diminish the yield. As an instance either of the effect of unusual skill in their cultivation, or the advantage of location or soil for their development, Isaac E. Coburn was enabled to make the finest display of potatoes at the Annual Exhibition that we remember to have seen from any one exhibitor for a long time, if ever. He was awarded the first prize in each of the six classes. It was considered somewhat remarkable that all the different varieties shown by this exhibitor were equally clean, smooth, and well grown, and without the slightest trace of disease on a single specimen. Their superiority was perhaps made more noticeable by comparison with some other exhibits on the same table.

At the Annual Exhibition the collections of vegetables were much better than we had anticipated seeing at the close of such an unfavorable summer. It would seem as though some favored sections had escaped the misfortunes of the season, and had come out at this time with the results of the harvest to fill the tables at this exhibition.

The most noticeable deficiency at this show was in the stands of Celery, Cauliflowers, and Melons, all of which were more or less injured by the unseasonable weather, and the last named crop was almost a total failure. At this exhibition the Special Prizes, No. 486, for Cauliflowers, were awarded, first, to William H. Teele, and the second to Warren W. Rawson. The Special Prizes, No. 487, for Celery, were awarded to Charles A. Learned, first, and Warren W. Rawson, second.

It is a pleasure to record the fact that while we are constantly gaining new and valued contributors, several old ones, who from some cause had dropped out for several successive years, have this season again put in an appearance, and were to be found in

their accustomed places, thereby adding by their presence and their contributions to the interest and success of our exhibitions.

Of the $1,000 appropriated for prizes and gratuities at the Society's exhibitions in this department during the past year, there has been awarded by your Committee the sum of $948, leaving an unexpended balance of $52.

Annexed will be found, a list of the awards of prizes and gratuities made by your Committee during the year.

Respectfully submitted,

For the Committee,

CHARLES N. BRACKETT,

Chairman.

PRIZES AND GRATUITIES AWARDED FOR VEGETABLES.

January 5.

Radishes.—Four bunches of any variety, George F. Stone,	$3 00
Cauliflowers.—Four specimens, William H. Teele,	3 00
Lettuce.—Four heads, George F. Stone,	3 00
Parsley.—Two quarts, George F. Stone,	3 00
Mushrooms.—Twenty-four specimens, Oak Grove Farm,	3 00
Tomatoes.—Twelve specimens, Winter Brothers,	3 00
Second, Cephas H. Brackett,	2 00
Third, Charles Winter,	1 00

Gratuities:—

Oak Grove Farm, Rhubarb,	2 00
Cephas H. Brackett, Asparagus,	2 00
Warren Heustis & Son, Celery,	1 00

February 2.

Radishes.—Four bunches of any variety, George F. Stone,	3 00
Second, W. W. Rawson,	2 00
Cucumbers.—Pair of any variety, John L. Gardner,	3 00
Dandelions.—Peck, George F. Stone,	3 00
Lettuce.—Four heads of Tennisball, W. W. Rawson,	3 00
Second, George F. Stone,	2 00
Rhubarb.—Twelve stalks, George E. Sanderson,	3 00
Second, Cephas H. Brackett,	2 00
Tomatoes.—Twelve specimens, Winter Brothers, Essex,	3 00
Second, Charles Winter, Essex,	2 00
Third, Winter Brothers, President Cleveland,	1 00

Gratuities:—

Cephas H. Brackett, Asparagus,	1 00
Mrs. Francis B. Hayes, Parsley and Cress,	1 00
Joseph S. Chase, Sibley Squashes,	1 00
W. W. Rawson, Mushrooms,	1 00

February 9.

Gratuity:—

George F. Stone, Lettuce,	1 00

February 16.

Gratuity:—

George F. Stone, Collection,	2 00

FEBRUARY 23.

Gratuity :—

George F. Stone, Collection, ... 1 00

MARCH 16.

Gratuity :—

Frederick C. Fisher, Collection, ... 3 00

SPRING EXHIBITION.

MARCH 27, 28, AND 29.

RADISHES.—Four bunches of Turnip Rooted, Varnum Frost, . . 3 00
Second, George F. Stone, ... 2 00
Third, W. W. Rawson, ... 1 00
Long Scarlet, W. W. Rawson, ... 3 00
Second, George F. Stone, ... 2 00
ASPARAGUS.—Two bunches, Cephas H. Brackett, ... 3 00
CUCUMBERS.—Pair of White Spine, Frederick C. Fisher, . . 3 00
Second, W. W. Rawson, ... 2 00
Third, Cephas H. Brackett, ... 1 00
DANDELIONS.—Peck, Warren S. Frost, ... 3 00
Warren Heustis & Son, ... 2 00
Third, George F. Stone, ... 1 00
LETTUCE.—Four heads of Tennisball, Frederick C. Fisher, . . 3 00
Second, W. W. Rawson, ... 2 00
Third, George F. Stone, ... 1 00
WATER CRESS.—Two quarts, Mrs. Francis B. Hayes, . . . 2 00
PARSLEY.—Two quarts, George F. Stone, Fern Leaved, . . . 2 00
Second, George F. Stone, Curled, ... 1 00
RHUBARB.—Twelve stalks, Cephas H. Brackett, ... 3 00
Second, George E. Sanderson, ... 2 00
TOMATOES.—Twelve specimens, Winter Brothers, Essex, . . 3 00
Second, Cephas H. Brackett, Emery 2 00
Third, " " " Essex, ... 1 00

Gratuities :—

Oak Grove Farm, Mushrooms, ... 1 00
M. W. Chadbourne, Artichokes, ... 1 00

APRIL 6.

ASPARAGUS.—Two bunches, twelve stalks each, Cephas H. Brackett, 3 00
CUCUMBERS.—Pair of White Spine, Cephas H. Brackett, . . 3 00
Second, Frederick C. Fisher, ... 2 00
Any other variety, Cephas H. Brackett, Brighton, . . . 3 00
MUSHROOMS.—Twenty-four specimens, Cephas H. Brackett, . . 3 00

Gratuities :—

Winter Brothers, Tomatoes, ... 1 00
Cephas H. Brackett, " 1 00

April 20.

Gratuity :—

Walter Russell, Radishes, ... 1 00

May 4.

Gratuities :—

Walter Russell, Collection, ... 3 00
Mrs. Francis B. Hayes, Potatoes, three varieties, ... 2 00

MAY EXHIBITION.

May 11.

Asparagus.—Four bunches, Leonard W. Weston, ... 3 00
Second, Charles E. Grant, ... 2 00
Cucumbers.—Pair, Varnum Frost, White Spine, ... 3 00
Second, Cephas H. Brackett, " " 2 00
Third, " " " Brighton, ... 1 00
Spinach.—Peck, Warren Heustis & Son, Thick Leaved, . . 3 00
Second, " " " Arlington, . . . 2 00
Third, Walter Russell, " 1 00
Dandelions.—Peck, Warren Heustis & Son, ... 2 00
Second, Walter Russell, ... 1 00
Lettuce.—Four heads, the third prize to Walter Russell, . . 1 00
Rhubarb.—Twelve stalks, Cephas H. Brackett, ... 3 00
Second, Warren Heustis & Son, ... 2 00

Gratuities :—

Walter Russell, Collection, ... 2 00
Cephas H. Brackett, Tomatoes, ... 1 00
Mrs. Francis B. Hayes, Potatoes and Parsley, ... 2 00
Warren Heustis & Son, Radishes, ... 1 00

May 18.

Gratuities :—

Cephas H. Brackett, Tomatoes, three varieties, ... 2 00
George F. Stone, Collection, ... 1 00
M. Ernest Moore, Radishes, ... 1 00

RHODODENDRON SHOW.

June 1.

Theodore Lyman Fund.

Beets.—Twelve specimens of any variety, Warren Heustis & Son, 3 00
Radishes.—Four bunches of Long Scarlet, Charles A. Learned, . 3 00
Asparagus.—Four bunches, twelve stalks each, Leonard W. Weston, ... 3 00
Second, Charles E. Grant 2 00

CUCUMBERS.—Pair, Varnum Frost, ... 3 00
Second, Frederick C. Fisher, ... 2 00
Third, Charles A. Learned, ... 1 00
LETTUCE.—Four heads, Charles A. Learned, ... 3 00
Second, Varnum Frost, ... 2 00
Third, Warren Heustis & Son, ... 1 00
RHUBARB.—Twelve stalks, Cephas H. Brackett, ... 3 00
Second, Benjamin G. Smith, ... 2 00
Third, Varnum Frost, ... 1 00

Gratuities:—

Joseph S. Fay, Cauliflowers, ... 2 00
Cephas H. Brackett, Peas and Tomatoes, ... 2 00
Winter Brothers, Tomatoes, ... 1 00
Charles A. Learned, Collection, ... 3 00
Warren Heustis & Son, " 1 00

JUNE 8.

Gratuities:—

Charles A. Learned, Collection, ... 2 00
Charles E. Grant, Peas, ... 1 00
Cephas H. Brackett, Peas and Tomatoes, ... 1 00

JUNE 15.

Gratuities:—

Charles E. Grant, Peas, ... 1 00
Charles A. Learned, Collection, ... 2 00
" " " Cauliflowers, ... 1 00

ROSE AND STRAWBERRY EXHIBITION.

JUNE 18 AND 19.

BEETS.—Twelve Summer Turnip Rooted, W. W. Rawson, . . 3 00
Second, Charles A. Learned, ... 2 00
Third, Warren Heustis & Son, ... 1 00
ONIONS.—Twelve, Charles A. Learned, White Portugal, . . 3 00
Second, Warren Heustis & Son, " " . . . 2 00
Third, Charles A. Learned, Danvers, ... 1 00
CUCUMBERS.—Pair of White Spine, W. W. Rawson, . . . 3 00
Second, Charles A. Learned, ... 2 00
Third, Warren Heustis & Son, ... 1 00
CABBAGES.—Three of any variety, Charles A. Learned, Wakefield, 3 00
Second, Charles A. Learned, Henderson, ... 2 00
Third, Warren Heustis & Son, ... 1 00
LETTUCE.—Four heads of any variety, M. Ernest Moore, . . 3 00
Second, Charles A. Learned, ... 2 00
Third, W. W. Rawson, ... 1 00

PEAS.—Peck, Samuel Hartwell, ... 3 00
Second, P. G. Hanson, ... 2 00
Third, Charles E. Grant, ... 1 00

Gratuities :—

Charles A. Learned, Collection, ... 4 00
Cephas H. Brackett, " 3 00
George F. Stone, " 2 00
John B. Moore & Son, Tomatoes, ... 1 00
Winter Brothers, " 1 00

JUNE 22.

Gratuity :—

Charles N. Brackett, Advancer Peas, ... 1 00

JUNE 29.

Gratuities :—

Charles N. Brackett, Stratagem Peas, ... 1 00
Charles E. Grant, " " 1 00

JULY 6 AND 13.

ONIONS.—Twelve specimens, Charles A. Learned, Portugal, . . 2 00
Second, Charles A. Learned, Danvers, ... 1 00
SQUASHES.—Four Long Warted, Warren Heustis & Son, . . 2 00
CABBAGES.—Three of any variety, Charles A. Learned, Drumhead, 3 00
Second, Warren Heustis & Son, ... 2 00
Third, Charles A. Learned, Henderson, ... 1 00
PEAS.—Half-peck of any variety, P. G. Hanson, ... 3 00
Second, Charles N. Brackett, ... 2 00
Third, Charles E. Grant, ... 1 00

Gratuities :—

Charles A. Learned, Collection, ... 4 00
W. W. Rawson, Beets, ... 1 00
Winter Brothers, Tomatoes, ... 1 00

POTATOES.—Twelve, Cephas H. Brackett, Triumph, . . . 3 00
Second, Cephas H. Brackett, Hebron, ... 2 00
Third, Caleb Bates, Sunrise, ... 1 00
SQUASHES.—Four Long Warted, Warren Heustis & Son, . . 2 00
BEANS.—Half-peck of String, Charles N. Brackett, . . . 3 00
Second, Warren Heustis & Son, ... 2 00
Third, Caleb Bates, ... 1 00
PEAS.—Half-peck of any variety, Charles E. Grant, Stratagem, . 3 00
Second, Charles N. Brackett, Advancer, ... 2 00
Third, Calvin Terry, " 1 00

JULY 13.

Levi Whitcomb Fund.

BEANS.—Half-peck Cranberry, Charles N. Brackett, . . . 3 00
Second, Warren Heustis & Son, ... 2 00
Third, Isaac E. Coburn, ... 1 00
PEAS.—Half-peck of any variety, Charles E. Grant, Stratagem, . 3 00
Second, Charles N. Brackett, Stratagem, ... 2 00
Third, " " " Telephone, ... 1 00
SWEET CORN.—Twelve ears, Cephas H. Brackett, Crosby, . . 3 00
Second, Caleb Bates, Corey, ... 2 00
Third, Charles N. Brackett, Corey, ... 1 00
TOMATOES.—Twelve of open culture, Cephas H. Brackett, Champion, ... 3 00

Gratuities:—

William G. Prescott, Peas, ... 1 00
M. W. Chadbourne, Corn and Peas, ... 1 00
Oliver R. Robbins, Potatoes, Pearl of Savoy, ... 1 00
Charles N. Brackett, New Blue Podded Beans, and Potatoes, . . 2 00
Warren Heustis & Son, Potatoes, ... 1 00
Samuel Hartwell, " 1 00
Cephas H. Brackett, " 1 00
Isaac E. Coburn, Beans, ... 1 00

JULY 20.

POTATOES.—Twelve, Isaac E. Coburn, Hebron, ... 3 00
Second, P. G. Hanson, Hebron, ... 2 00
Third, Isaac E. Coburn, Rose, ... 1 00
SWEET CORN.—Twelve ears, Charles N. Brackett, Corey, . . 3 00
Second, Cephas H. Brackett, Corey, ... 2 00
Third, Charles E. Grant, " 1 00

Gratuities:—

Cephas H. Brackett, Collection, ... 2 00
Charles N. Brackett, Peas, ... 1 00
Charles E. Grant, " 1 00

JULY 27.

POTATOES.—Twelve of any variety, P. G. Hanson, Hebron, . . 3 00
Second, Isaac E. Coburn, Essex, ... 2 00
Third, Charles B. Lancaster, Clark, ... 1 00
SQUASHES.—Three Marrow, Edward J. Coolidge, ... 3 00
PEAS.—Half-peck of any variety, Sidney Lawrence, Stratagem, . 3 00
Second, Charles E. Grant, Champion, ... 2 00
Third, Isaac E. Coburn, Stratagem, ... 1 00

Sweet Corn.—Twelve ears, E. J. Coolidge, Belmont,	3 00
Second, Warren S. Frost, Crosby,	2 00
Third, Charles E. Grant, "	1 00
Tomatoes.—Twelve, Isaac E. Coburn, Champion,	3 00
Second, Charles N. Brackett, Emery,	2 00

Gratuities:—

Sidney Lawrence, Beans,	1 00
Charles N. Brackett, Collection,	2 00
Charles E. Grant, Potatoes,	1 00

August 3.

Beans.—Half-peck of Horticultural, A. S. McIntosh,	3 00
Tomatoes.—Twelve Acme, Charles N. Brackett,	3 00
Second, Charles E. Grant,	2 00
Emery, George Hill,	3 00
Second, Charles N. Brackett,	2 00
Third, P. G. Hanson,	1 00
Any other variety, George Hill, Cardinal,	3 00
Edward J. Coolidge, Livingston,	2 00
Isaac E. Coburn, Champion,	1 00
Egg Plant.—Four Round Purple, Edward J. Coolidge,	3 00

Gratuities:—

Charles N. Brackett, Collection,	3 00
Samuel Hartwell, "	3 00
Charles E. Grant, "	2 00
Joseph H. Woodford, Beans,	1 00
P. G. Hanson, "	1 00
Calvin Terry, Corn,	1 00

August 10.

Greenflesh Melons.—Four, Varnum Frost,	3 00
Second, Warren Heustis & Son,	2 00
Sweet Corn.—Twelve ears, Edward J. Coolidge,	3 00
Second, Oliver R. Robbins,	2 00
Third, Charles N. Brackett,	1 00
Egg Plant.—Four Round Purple, Edward J. Coolidge,	2 00

Gratuities:—

Charles E. Grant, Beans,	2 00
Mrs. Francis B. Hayes, Potatoes,	2 00
George Hill, Tomatoes,	1 00
Varnum Frost, Tomatoes,	1 00
Nathaniel T. Kidder, Peach Tomatoes,	1 00
Edward J. Coolidge, Collection,	3 00

George F. Stone, Collection, ... 3 00
Charles N. Brackett, " 2 00

AUGUST 17.

POTATOES.—Twelve of any variety, P. G. Hanson, Hebron, . . 3 00
Second, Mrs. Francis B. Hayes, Lee's Favorite, . . . 2 00
Third, Leonard W. Weston, Hampden, ... 1 00
MELONS.—Sweet, four of any variety, Varnum Frost, . . . 3 00
Second, Warren Heustis & Son, Champion, ... 2 00
Third, " " " Hackensack, ... 1 00
LIMA BEANS.—Two quarts, Benjamin G. Smith, ... 3 00
Second, Edward J. Coolidge, ... 2 00
Third, Charles E. Grant, ... 1 00
GODDARD BEANS.—Two quarts, shelled, P. G. Hanson, . . . 3 00
Second, Edward J. Coolidge, ... 2 00
Third, William Christie, ... 1 00
PEPPERS.—Twelve specimens, Charles N. Brackett, Squash, . . 3 00
Second, Nathaniel T. Kidder, Bull-nose, ... 2 00
Third, Charles N. Brackett, Ruby King, ... 1 00

Gratuities :—

Charles E. Grant, Henderson's Bush Lima Beans, ... 1 00
Charles N. Brackett, Collection, ... 3 00
P. G. Hanson, " 3 00
Charles E. Grant, " 2 00

AUGUST 24.

WATERMELONS.—Pair, Charles E. Grant, Black Spanish, . . 3 00
Second, Calvin Terry, Black Spanish, ... 2 00
GREENFLESH MELONS.—Four, Warren Heustis & Son, Hackensack, 3 00
Second, Joseph S. Fay, Casaba, ... 2 00
PEPPERS.—Twelve, Charles N. Brackett, Squash, ... 3 00
Second, Charles N. Brackett, Ruby King, . . . 2 00
SWEET CORN.—Twelve ears, Charles N. Brackett, Potter's Excelsior, ... 3 00
Second, William H. Hunt, Burr's, ... 2 00
Third, Samuel Hartwell, " 1 00

Gratuities :—

Varnum Frost, Lima Beans, ... 1 00
Joseph S. Fay, Melons, ... 1 00
P. G. Hanson, Collection, ... 3 00
Charles N. Brackett, " 2 00
Charles E. Grant, " 2 00

AUGUST 31.

CABBAGES.—Three of any variety, Oliver R. Robbins, . . . 3 00
Second, Charles B. Lancaster, ... 2 00

BEANS.—Two quarts of Large Lima, Varnum Frost, . . . 3 00
Second, Benjamin G. Smith, ... 2 00
Third, Charles N. Brackett, ... 1 00
PEPPERS.—Twelve, Charles N. Brackett, Squash, ... 3 00
Second, Charles N. Brackett, Ruby King, ... 2 00
Third, Warren Heustis & Son, ... 1 00

Gratuities:—

Charles E. Grant, Peach Tomatoes, ... 1 00
Samuel Hartwell, Sweet Corn, ... 1 00
Charles N. Brackett, Collection, ... 3 00
Charles E. Grant, " 2 00

SEPTEMBER 7.

Gratuities:—

Charles A. Learned, Cauliflowers, ... 1 00
Charles E. Grant, Gold Coin Sweet Corn, ... 1 00
Charles N. Brackett, Collection, ... 3 00
Charles A. Learned, " 3 00
Charles E. Grant, " 3 00
George F. Stone, " 2 00

ANNUAL EXHIBITION.

SEPTEMBER 17, 18, 19, AND 20.

Special Prizes.

CAULIFLOWERS.—Best four specimens and best kept during the exhibition, William H. Teele, ... 5 00
Second, W. W. Rawson, ... 4 00
CELERY.—Best four specimens, and best kept during the exhibition, Charles A. Learned, ... 8 00
Second, W. W. Rawson, ... 6 00

Regular Prizes.

BEETS.—Twelve Turnip Rooted, Varnum Frost, ... 3 00
Second, Edward J. Coolidge, ... 2 00
Third, Warren W. Rawson, ... 1 00
CARROTS.—Twelve Long Orange, Walter Russell, ... 3 00
Twelve Intermediate, Warren W. Rawson, ... 3 00
Second, William Christie, ... 2 00
Third, Mrs. Francis B. Hayes, ... 1 00
PARSNIPS.—Twelve Long, W. W. Rawson, ... 3 00
Second, W. W. Rawson, Student, ... 2 00
Third, Charles A. Learned, ... 1 00

Potatoes.—Four varieties, twelve specimens each, Isaac E. Coburn,	5 00
Second, Charles W. Stone,	4 00
Third, William Christie,	3 00
Twelve Clark, Isaac E. Coburn,	3 00
Second, William Christie,	2 00
Third, Charles B. Lancaster,	1 00
Hebron, Isaac E. Coburn,	3 00
Second, P. G. Hanson,	2 00
Third, G. W. Goddard,	1 00
Rose, Isaac E. Coburn,	3 00
Second, Calvin Terry,	2 00
Third, G. W. Goddard,	1 00
Savoy, Isaac E. Coburn,	3 00
Second, G. W. Goddard,	2 00
Any other variety, Isaac E. Coburn, Essex,	3 00
Second, Charles N. Brackett, Charles Downing,	2 00
Third, G. W. Goddard,	1 00
Salsify.—Twelve roots, Charles F. Curtis,	3 00
Second, Charles A. Learned,	2 00
Third, Walter Russell,	1 00
Turnips.—Twelve Flat, Walter Russell,	2 00
Second, George F. Stone,	1 00
Twelve Swedish, P. G. Hanson,	2 00
Second, William Christie,	1 00
Onions.—Twelve Danvers, Charles A. Learned,	3 00
Second Warren Heustis & Son,	2 00
Third, Warren S. Frost,	1 00
Portugal, George F. Stone,	3 00
Red, Warren Heustis & Son,	3 00
Second, George F. Stone,	2 00
Third, George W. Jameson,	1 00
Greenflesh Melons.—Four, Joseph S. Fay, Bay View,	3 00
Second, Charles E. Grant,	2 00
Watermelons.—Pair, Charles E. Grant, Black Spanish,	3 00
Second, Charles E. Grant, Green and Gold,	2 00
Third, " " " Kolb's Gem,	1 00
Squashes.—Three Hubbard, Walter Russell,	3 00
Second, G. W. Goddard,	2 00
Third, James J. H. Gregory,	1 00
Three Hybrid Turban, Charles A. Learned,	3 00
Second, W. W. Rawson,	2 00
Third, G. W. Goddard,	1 00
Marblehead, P. G. Hanson,	3 00
Second, Charles A. Learned,	2 00
Marrow, Varnum Frost,	3 00
Second, P. G. Hanson,	2 00
Third, G. W. Goddard,	1 00

Turban, P. G. Hanson,	3 00
Second, G. W. Goddard,	2 00
Third, E. Hemmenway,	1 00
CABBAGES.—Three Drumhead, Charles B. Lancaster,	3 00
Second, Oliver R. Robbins,	2 00
Third, S. A. Merrill,	1 00
Three Red, E. J. Coolidge,	3 00
Savoy, Walter Russell,	3 00
Second, C. B. Lancaster,	2 00
Third, William Christie,	1 00
CAULIFLOWERS.—Four, W. W. Rawson,	3 00
Second, William H. Teel,	2 00
CELERY.—Four roots Boston Market, W. W. Rawson,	5 00
Any other variety, Charles A. Learned, Arlington,	5 00
Second, W. W. Rawson,	4 00
ENDIVE.—Four specimens, M. W. Chadbourne,	3 00
HORSERADISH.—Six roots, Charles A. Learned,	3 00
Second, W. W. Rawson,	2 00
Third, Walter Russell,	1 00
BEANS.—Two quarts of Large Lima, Varnum Frost,	3 00
Second, Benjamin G. Smith,	2 00
Third, Charles N. Brackett,	1 00
SWEET CORN.—Twelve ears, P. G. Hanson, Stowell's,	3 00
Second, Mrs. Francis B. Hayes "	2 00
Third, William H. Hunt, Burr's,	1 00
FIELD CORN.—Twenty-five ears, William Christie,	3 00
Second, Leonard W. Weston,	2 00
Third, G. W. Goddard,	1 00
EGG PLANT.—Four Round Purple, Edward J. Coolidge,	3 00
Second, Joseph S. Fay,	2 00
TOMATOES.—Three varieties, twelve specimens each, Charles N. Brackett,	5 00
Second, William Christie,	4 00
Third, W. W. Rawson,	3 00
Twelve Acme, G. W. Goddard,	3 00
Second, George E. Sanderson,	2 00
Third, George F. Stone,	1 00
Emery, P. G. Hanson,	3 00
Second, Varnum Frost,	2 00
Third, Charles N. Brackett,	1 00
Paragon, Varnum Frost,	3 00
Second, George E. Sanderson,	2 00
Third, William Christie,	1 00
Cardinal, Varnum Frost,	3 00
Second, Samuel Hartwell,	2 00
Third, Charles N. Brackett,	1 00
Any other variety, G. W. Goddard, Beauty,	3 00
Second, P. G. Hanson, Perfection,	2 00
Third, Richard T. Lombard, Red Cross,	1 00

PEPPERS.—Twenty-four specimens, Charles N. Brackett, Squash, . 3 00
Second, Charles N. Brackett, Ruby King, ... 2 00
Third, George W. Jameson, Squash, ... 1 00

Gratuities:—

Joseph S. Fay, Collection of Melons, ... 3 00
Walter Russell, " 3 00
S. A. Merrill, " 1 00
William Christie, Bush Squash, new, ... 1 00
Edward J. Cooledge, Egg Plant, ... 1 00
S. A. Merrill, Mammoth Squash, ... 2 00
James F. C. Hyde, Sweet Potatoes, ... 1 00
Eben Davis, " " 1 00
W. W. Rawson, Bay State Squashes, ... 1 00
James J. H. Gregory, Collection, ... 5 00
Charles A. Learned, Collection, ... 5 00
E. J. Coolidge, " 5 00

OCTOBER 5.

Theodore Lyman Fund.

SALSIFY.—Twelve roots, George W. Jameson, ... 3 00
Third, George F. Stone, ... 1 00
SQUASHES.—Three Hubbard, Edward J. Coolidge, ... 3 00
Second, Calvin Terry, ... 2 00
Third, P. G. Hanson, ... 1 00
Marrow, Varnum Frost, ... 3 00
Second, Edward J. Coolidge, ... 2 00
Third, G. W. Goddard, ... 1 00
BRUSSELS SPROUTS.—Half-peck, Mrs. Francis B. Hayes, . . 3 00
Second, William Christie, ... 2 00
CABBAGES.—Three Drumhead, Charles B. Lancaster, . . . 3 00
Second, William Christie, ... 2 00
Third, George F. Stone, ... 1 00
Three Red, E. J. Coolidge, ... 3 00
Third, C. E. Parker, ... 1 00
Three Savoy, Charles B. Lancaster, ... 3 00
Second, William Christie, ... 2 00
Third, E. J. Coolidge, ... 1 00
CELERY.—Four roots Boston Market, Artemas Frost, . . . 4 00
Second, Isaac E. Coburn, ... 3 00

Gratuities:

Charles E. Grant, Melons, ... 2 00
George W. Jameson, Collection, ... 3 00
E. J. Coolidge, " 3 00
Charles N. Brackett, " 2 00

NOVEMBER 9.

CUCUMBERS.—Pair, Cephas H. Brackett,	3 00
Second, Richard T. Lombard,	2 00
Third, Frederick C. Fisher,	1 00
CABBAGES.—Three Red, George E. Sanderson,	3 00
Second, Edward J. Coolidge,	2 00
Third, P. G. Hanson,	1 00
Savoy, William Christie,	3 00
Second, P. G. Hanson,	2 00
BRUSSELS SPROUTS.—Half-peck, William Christie,	3 00
CAULIFLOWERS.—Four, William H. Teele,	3 00
CELERY.—Four roots, Warren S. Frost,	3 00
Second, Charles A. Learned,	2 00
Third, Warren Heustis & Son,	1 00
LETTUCE.—Four heads, Warren Heustis & Son,	3 00
Second, Joseph S. Fay,	2 00
Third, George F. Stone,	1 00
TOMATOES.—Twelve, Winter Brothers, Scoville,	3 00
Second, Winter Brothers, President Cleveland,	2 00
Third, Cephas H. Brackett, Champion,	1 00

Gratuities:—

P. G. Hanson, Collection of Squashes,	2 00
Cephas H. Brackett, Mushrooms,	1 00

REPORT

OF THE

COMMITTEE ON GARDENS,

FOR THE YEAR 1889.

By JOHN G. BARKER, Chairman.

We present to the Society a report of our proceedings during another season. We have been called upon for visitation in our official capacity less than we had hoped at the commencement of the year we might be, but we trust that what we have to say will be of interest, and that we can show that progress is being made in the art to which most of us have given our lives thus far and in which we expect to spend our remaining days. Undoubtedly the season, which has been unusually wet, has had its influence to decrease the number of invitations which otherwise the Committee might reasonably have expected; especially would this be true of strawberry gardens and vineyards, as for several seasons the latter have commanded the attention of your Committee more than any other objects, and although the premiums that have been offered have not been as large as some have thought they should be, we think our past and present reports will show that a desire has been created to improve the cultivation of our hardy grapes, and we feel assured that no premiums have been offered which have excited more worthy competition, and that at the same time they have proved a strong stimulus to improved cultivation.

Langwater Gardens, North Easton, the Residence of Frederick L. Ames.

The special object of our visits to this charming place was to inspect the elegant collection of orchids, and at the times of

our visits — January 10 and April 2 — little else was to be seen. For several years past the exhibitions of this Society have been made more attractive by the magnificent plants from Mr. Ames's collection. No prizes ever offered have been more worthily bestowed than those given for orchids, and no other class of plants ever commanded the attention and elicited the admiration of the public as they have. This Committee have appreciated fully the liberality of Mr. Ames in allowing his best plants to adorn our tables, but we have desired that a more extended notice might be given of this superb collection than could be bestowed upon the few sent in from time to time as the different exhibitions occurred. Much attention is now being given to their cultivation, since it has been demonstrated that the art of growing them is not so much of a mystery as at one time was supposed. The fact that many varieties can be grown for their flowers at a good profit has induced florists, as well as wealthy amateurs to cultivate them quite largely.

The unique as well as the superb character of the specimens of new and rare varieties in Mr. Ames's collection commanded our attention.

The Cattleya house, where most of the blooming plants were, is span-roofed, one hundred feet long by twenty feet wide, and is built in the most thorough and substantial manner. There is no woodwork at all; the material is all iron and glass. The benches are of slate, the floors of cement, and the steam-heating apparatus is of the latest and most approved make. It is not too much to say that this is as complete a house in all its appointments for practical use, and at the same time as good a show house, as we have ever seen.

In a communication from William Robinson, the skilful gardener, he remarks that: "There is a generally accepted idea that the best time to view a collection of orchids is in February or March. While those are certainly good months in which to see a good display of orchids, I do not for my part know whether from January to June there is any one month better than another. Each month is interesting, as there are species which follow each other so regularly that as the blooming time of any one is closing others are in bloom even more brilliant than the preceding ones." It would take more space and time than we can command to enumerate even one-half of the plants in this collection, but we

will name a few as they flower each month. While the season can be prolonged or retarded a few weeks, it is not wise to do so if the future welfare of the plants is consulted, neither are the present results so satisfactory. With Mr. Ames's large collection he can have *Cattleya Percivaliana* in bloom in December, and some even in February or March. The same is true of the varieties of *Cattleya Trianæ;* also of *Lælia anceps* and varieties, Dendrobiums, Odontoglossums, Cœlogynes, Cypripediums, etc.

In the months of January, February and March, the following named varieties of *Lælia anceps* may be seen—*Dawsoni*, a charming variety, properly called the Queen of all Lælias; *Scottiana*, *Winniana*, *Protheroiana* and *Sanderiana;* also *Cattleya Percivaliana*, *C. Lawrenceana*, and *C. Schrœderæ* all in variety; of *C. Trianæ* and varieties, including the brilliant splashed form, *Backhousiana*, the immense flowers of *C. Trianæ Leeana*, of which Mr. Ames owns part of the original plants; the varieties *Eboracensis* and *Dayana*, which in form are unequalled; *alba*, *delicata*, *chocoensis*, etc. All are chaste and beautiful; and in a collection of two hundred plants of *C. Trianæ* there are scarcely two which do not vary in some slight degree, but the varieties above named are all recognized as among the finest extant.

Of Dendrobiums the following are particularly worthy of notice:

D. Wardianum, a superb variety having sepals and petals white, with the upper portion bright rich magenta, broad, thick, wavy; lip large, white above, rich orange in the lower part, with two deep eye-like spots of crimson magenta.

D. nobile is the oldest species in cultivation, and the best known orchid grown; undoubtedly if only one orchid could be had this would be the one above all others, that would be selected.

Of *D. nobile nobilius*, Mr. W. H. Gower in "The Garden," London, January 18, 1890, says: "In its growth it exactly resembles the typical plant, the sepals and petals are a rich rosy purple, the petals much the darker, and far darker towards the tips; lip large, considerably over an inch across, the base of the lip is very dark purplish black. In front of this is a zone of white, the apical portion recurved and of a rich deep amaranth purple, the flowers being thick and fleshy in texture; it is a variety which cannot be mistaken, and it is without doubt the finest extant for depth of color."

D. euosmum is cream colored, marked purple, and powerfully scented; it is a hybrid between *D. endocharis* and *D. nobile*.

D. Leechianum and *D. splendidissimum* are beautiful, distinct garden hybrids, obtained by fertilizing *D. nobile* with *D. aureum*.

Few Dendrobes are more beautiful than *D. crassinode*, the pure white of the petals tipped with purple, and the delicate yellow of the throat, are colors that harmonize so well as to give the flower an unusually handsome appearance.

D. Melanopthalmum is a natural hybrid between *D. Wardianum* and *D. crassinode*.

D. densiflorum (dense flowered) has flowers of a rich clear amber color, produced in long pendulous racemes springing from immediately below the junction of the leaf and stem. The lip is orange colored and delicately and beautifully fringed. This is a very handsome free flowering species.

D. Farmeri is a beautiful compact evergreen orchid, with dark green foliage; the flowers are pink, with a yellow centre.

D. chrysotoxum is a strong erect evergreen species. The sepals and petals are of a pale yellow, and the lip a deeper yellow. It is a fine upright growing variety.

Other fine species are *Phalænopsis Schilleriana*, a charming species from Manila, with beautifully variegated foliage, quite distinct from all other kinds. The flower spikes are produced from the axils of the leaves, and the blossoms are arranged in two rows down the spike. The sepals and petals are a beautiful light mauve edged with white; the lower part of the lip is of the same color with darker spots, while the upper part is yellow spotted with reddish brown; the inside is handsomely spotted and the whole plant is exceedingly attractive.

P. amabilis has been called the Queen of all Orchids. The spikes of flowers are very graceful. The flowers are produced nearly the whole year round, and are arranged in two rows down the spike. The sepals and petals are pure white; the lip is of the same color, but has the inside streaked with rose pink. The flowers keep in perfection a long time.

P. Boxallii has sepals and petals of sulphur color, the former barred and blotched with brown; lobe of lip white and crescent shaped.

P. Stuartiana. Flowers cream colored, except that the sepals outside and the inferior halves of the lateral sepals inside are of a light sulphur color with dark cinnamon blotches, while the lip is pure white at the top.

Aerides expansum. Sepals and petals creamy white, with purple markings; the lip is fully expanded and the spur of a greenish color. A very fine variety.

A. Leoni.

A. Houlletianum.

A. Fieldingii is called the Fox-brush Aerides. The flowers are large, white, mottled with bright rose color. The racemes are from two to three feet long and last in flower several weeks.

Aeranthus Leonis. Flowers ivory white and not unlike those of *Angræcum sesquipedale*, but having a shorter spur, which is funnel shaped at the base, then filiform and bent abruptly upwards.

Angræcum eburneum. A fine free flowering orchid, with light green, stiff, thick, and broad foliage, from twelve to eighteen inches long. The flowers are ivory white and are produced on upright spikes. It is a valuable decorative plant.

A. sesquipedale. The blooms are of a beautiful ivory white and very large with a tail or spur from twelve to eighteen inches long hanging from the bottom of each flower. This truly wonderful plant is rare and beautiful and without doubt the finest of the class.

A. fastuosum has flowers of ivory white and scented very much like tuberoses; it is one of the best.

A. citratum is a rare and pretty species. Its leaves are close set and the slender pendulous flower spike bears flowers of a pale yellow color closely set on the spike; the plant is of compact growth.

Anguloa eburnea is a valuable cool-house orchid. It has large dark colored bulbs while the leaves are bright green. The flowers are large and of the purest white, except the lip, which is spotted with pink.

A. Clowesii. A beautiful species with sepals and petals of bright yellow and pure white lip. It will last long in perfection if kept cool.

Lycaste Skinneri and its varieties are all very beautiful and of easy culture. They are well worthy of a place in every good collection of orchids, as are also *L. plana* and *L. plana Measuresiana*, two excellent varieties.

Cœlogyne cristata is a magnificent orchid, of which many beautiful specimens have been exhibited within a few years past. The flowers are produced from the bottom of the bulb on a drooping

spike, six or more together. The color is a beautiful white with a blotch of yellow on the lip. This is the finest species of the genus. *C. cristata alba* is without doubt the most beautiful variety, the whole flower being pure white, and no collection should be without it.

C. flaccida, *C. Dayana*, and *C. Massangeana*, all valuable plants, are found in this collection.

Of Cypripediums an unusually fine collection is found here. We noted the following as among the choicest: — *Cypripedium vexillarium*, a handsome variety which is a cross between *C. Fairieanum* and *C. barbatum*, and as yet is quite rare.

C. Harrisianum is a garden hybrid from *C. villosum* fertilized by *C. barbatum*.

C. Ashburtoniæ is not unlike *C. barbatum;* petals white, tinged with green and veined with purple; lip pale purple, tinged with yellow and slightly blotched with purple. It is a handsome hybrid.

C. Arthurianum has the dorsal sepal of a pale green tipped with white, and ornamented with clear dark pencillings. It is a hybrid between *C. insigne* and *C. Fairieanum*.

C. œnanthum.

C. Mastersianum.

C. Curtisi.

C. Fairieanum is small and rare.

C. ciliolare is said to resemble *C. superbiens*, of which it is probably a form, the sepals and petals having more numerous nerves and more hairy margins; the keel of the lip is shorter, and the staminode lower and broader.

C. Schrœderæ is a hybrid between *C. caudatum* and *C. Sedeni*.

C. albo-purpureum is a hybrid between *C. Domini* and *C. Sedeni*.

C. Measuresianum has the dorsal sepal yellow margined with white and veined with yellowish green; the petals are shaped as in *C. villosum* and are light brownish purple, changing to light orange, the upper half suffused purple; the lip is large, orange tinted, and veined purplish brown; scapes, purple, hairy.

Cymbidium eburneum.—The foliage is pale green, from sixteen to eighteen inches long and half an inch broad. The flowers are borne two together on erect scapes and are generally of the purest white. This is a superb species which flowers in spring and lasts fully six weeks in beauty.

C. affine is white with a few purplish dots on the anterior portion of the lip.

C. Lowianum.—Sepals and petals green with a few faint sepia-brown lines over the strongest nerves; the lip is whitish yellow. The colors are novel and attractive making it very distinct and beautiful and one of the handsomest of the Cymbidiums.

C. giganteum is a large growing species and a good plant for winter blooming. The flowers, which are produced on long upright spikes, are brown and purple, and continue long in perfection.

C. Mastersii is very much like *C. eburneum* in its growth, but the flowers are different, being white with yellow centres, and are produced on upright spikes, the former carrying seven or eight flowers, and the latter two.

C. tigrinum is a pretty plant with large flowers, which are greenish yellow spotted with red in the sepals and petals; the lip is large and tapers to a point, having its middle portion white striped with cross bars of red and purple, and its sides also striped with purple.

Of the truly beautiful genus Odontoglossum there is scarcely a single species that is not worth growing, and they have gained ground quite rapidly with orchid growers.

Odontoglossum crispum with its varieties is now quite numerous. "The Garden," says of it: "If we were asked to name the most useful, profitable, easily grown and beautiful orchid in cultivation it would without hesitation be our choice." Nothing can well surpass the chaste beauty of the blossoms of this orchid.

Among other species most prominent in Mr. Ames' superb collection were the following: *O. Pescatorei* in variety, *O. Lindleyanum*, *O. Sanderianum*, *O. gloriosum*, *O. triumphans* in varieties, *O. Andersonianum*, *O. Ruckerianum*, *O. Edithiæ*, *O. elegans.*

The genus Oncidium is the most numerous in species of the orchids, excepting only the Epidendrums. All the species are evergreen; some are large growers; others more compact, and a few have handsome spotted foliage. The flowers are quite beautiful, and some are rich and showy. We noticed particularly the following species:

Oncidium cucullatum is a small flowered, dwarf-growing species. The flowers are rose colored in the sepals and petals, and in the lip reddish purple spotted with deep purple. They are very beautiful and last a long time in perfection.

O. Harrisonianum is brownish yellow with purplish spots; the sepals and petals linear obtuse and the lip three lobed.

O. macranthum is said to be the best of the genus both as to size and beauty; the flower spike on one of the plants in bloom had attained a length of fifteen feet and the branches of the spike were bearing from ten to fifteen large flowers each. The sepals are of a warmish brown color; the petals clear golden yellow; the lip, shaped like a dagger, is of a bright purple; the flowers are from two to three inches across, and last a long time in perfection. It is a noble plant.

Masdevallias are a very interesting genus. They are beautiful compact growing plants and no collection should be without them. The species we noticed were:

M. ignea, with curious solitary orange scarlet blossoms which are produced on long slender scapes.

M. Lindeni has flowers of a pale silvery lilac color, in some varieties merging into rosy purple and exceedingly beautiful.

M. Veitchiana is said to be the handsomest of all the genus. Its leaves are a foot long; the flowers are large and grow singly on scapes at least fifteen inches high; their color is a very brilliant orange, the lower sepals densely set with bright purple hairs which, mingling with the orange beneath, give an indescribable brilliancy to the flower. Like the rest of the species it grows and flowers the year round.

M. Houtteana is one of the quaintest little plants, bristling with flowers.

Other species were *M. Chelsoni*, *M. Davisii*, *M. macrura*, *M. corniculata*, *M. amabilis*, *M. Harryana acanthifolia*, *M. ignea erubescens*, *M. ignea Massangeana*, *and M. Schlimii*, all very brilliant and beautiful.

Saccolabiums are among the finest orchids that are cultivated; the growth is compact, the foliage long, pendent, and evergreen; the flowers are produced on graceful racemes about a foot long.

S. giganteum is a beautiful species, producing long racemes of thickly set flowers; sepals and petals white, the latter spotted with lilac; lip lilac and violet. It lasts in bloom a long time and has a deliciously sweet fragrance.

S. violaceum is a magnificent species. The flowers, which are numerous, are produced on racemes a foot or more long, growing from the axils of the leaves. The sepals and petals are pure white

spotted with mauve; the lip dark mauve marked with deeper colored lines. Besides these two this large and choice collection includes most of the newest and best varieties.

The months of April, May, and June are particularly brilliant in Cattleyas, which stand in the front rank amongst orchids. There are *C. Trianæ*, *C. Skinneri*, and its congener, the chaste and lovely *C. Skinneri alba*, *C. amethystoglossa*, *C. Mendelii* including the varieties *Morganiæ*, *grandiflora*, *picturata*, *Wallacei*, *Leeana*, *pulcherrima*, *triumphans*, and others, all beautiful; the species *intermedia* and *Warneri*, and the rare and unique varieties of *C. Mossiæ—Arnoldiana*, *Reineckiana*, *Wageneri*, *alba*, *Massangeana*, *aurea*; *C. Gaskelliana alba* and other varieties, *C. Dowiana*, *C. gigas* in varieties, including the only plant yet seen of the white form, named *C. gigas Rochelliensis*, *Lælia purpurata*, and *L. elegans* and varieties.

Other genera are *Odontoglossum crispum*, *O. Pescatorei*, *O. Harryanum*, and *O. vexillarium* in numerous varieties, including *superbum; Masdevallia Harryana* — scarcely two alike in form or color; Cypripediums, which are always represented by some species or varieties; *Sobralia macrantha*, *S. macrantha alba* (very rare), *S. leucoxantha* and *S. xantholeuca*, the last here represented by the finest plant in cultivation; *Epidendrum vitellinum*, and *E. prismatocarpum; Vanda suavis*, *Calanthe Masuca* and many others.

There are now many hybrid orchids which have been introduced in the last few years, that add largely to the interest and grandeur of a collection, but being scarce are as yet very expensive.

It will undoubtedly add interest to this report to mention in a special list the orchids that have been named for Mr. Ames. *Lælia Amesiana* was exhibited at the Royal Horticultural Society's Show, July 24, 1888, and is described as an extremely beautiful hybrid Lælia. It is one of Messrs. Veitch's acquisitions, resulting from a cross between *Cattleya* (*Lælia*) *crispa* and *C. maxima*. It has the character of *C. crispa*; the flowers are about the size of an average *C. Mendelii*, and in the character of the petals a likeness to *L. elegans* is traceable. The sepals are narrow, twisted somewhat, and flushed with a pale amethyst tint; the petals are broader, wavy at the margin, and of the same delicate tint; the lip has a rich purple color except at the base, where it is yellow, this color running into the throat and intensifying the whiteness of the arched lateral lobes.

Lælia anceps Amesiana is also a superb variety; the flowers are large, resembling those of *L. anceps Dawsoni*, the sepals and petals are large, of a pearly white slightly flushed with flesh color, the pointed tips being rich rose color; the side lobes of the lip are heavily striped inside with deep crimson, the front lobe is smaller than usual, and its color is an intense violet-magenta — so deep that to a casual observer it appears to be black; the large crest is yellow. "The Garden" (London), from which we obtain this description, says: "This is a truly wonderful and valuable variety."

Cypripedium Amesianum is said to be a cool house orchid and as such is a valuable acquisition. It is the result of a cross between *C. villosum* and *C. venustum*, and appears to combine the characters of both plants in a charming manner.

Odontoglossum Rossii Amesianum is described as a charming variety, having large, bold, fine flowers, with colors well defined, and form exquisite, and it is undoubtedly a very valuable addition to the cool house orchids.

Vanda Amesiana was introduced by the Messrs. Low of Clapton. It is mentioned as a rather small growing plant, producing erect spikes of deliciously fragrant flowers, which are white, suffused with flesh color, the lip being rich rosy magenta, "W. H. G." in "The Garden," says: "Should this plant become free flowering under cultivation, it will be one of the glories of our plant houses."

Of rare and unique varieties, the following will be found quite worthy of looking up, and a lover of orchids will deem the time taken in so doing well and profitably spent.

Cattleya Bowringiana var. *lilacina*,
Cattleya Brabantiæ,
" *Brymeriana* var.
" *Eurydice*,
" *Fausta*,
" " *crispa*,
" *Gaskelliana alba*,
" " *Delliense*,
" *gigas Rochelliensis*,
" *Harrisii*,
" *Hardyana Amesi*,
Cattleya intricata,
" *leucoglossa*,
" *Mastersoni*,
" *Morganæ*,
" *Percivaliana*,
" *Reineckia superbissima*,
" *resplendens*,
" *Scita*,
" *Skinneri alba*,
" *Sororia*,
" *Stella*,
" *Wageneri*,

Cattleya Zenobia,
" (species) var. *Mendelii gigas*,
Cœlogyne cristata alba,
" *Dayana*,
" *tomentosa*,
Cypripedium Hyeanum,
" *Mastersi*,
" *T. B. Hayward*,
" *Wallisi*,
Dendrobium Arnoldianum,
" *Bromfieldi*,
" *Cybele*,
" *euosmum* var. *leucopterum*,
" *nobile* var. *nobilius*,
" *Phalænopsis*,
" *Schneideriana*,
" *Williamsi*,
Grammatophyllum Measuresianum,
Lælia anceps Scottiana,
" *callistoglossa*,
Lælia elegans Littleana,
" " *Turneri*, (several varieties.)
" *Euterpe*,
" *Exoniensis*,
" *Patinii alba*,
" *Philbrickiana*,
" *Pilcheri*,
" *purpurata Lowiana*,
" *triophthalma*,
" *Veitchiana*,
Odontoglossum excellens,
" *Schrœderianum*,
" *vexillarium superbum* varieties,
Oncidium Mantini,
" *ornithorynchum album*,
Saccolabium Heathi, (a unique plant.)
Zygocolax leopardinum,
" *Veitchii*.

The last two are new bigeneric hybrids; *Z. Veitchii* is a cross between *Zygopetalum crinitum* and *Colax jugosus*, and Mr. Ames's plant is the only one known. The generic name, it will be seen, is made up from those of the two genera hybridized.

We have tried to give you some idea of the beauty and richness of Mr. Ames's orchids. Our descriptive powers are not equal to our wishes, and you may not wonder that we consider our task a difficult one when we state that in selecting those we have mentioned we have made the choice from a collection numbering between seven and eight thousand plants, and representing over thirteen hundred acknowledged varieties. There are seven houses devoted to orchids, — two for Cattleyas, two for Odontoglossums, one for Dendrobiums and Phalænopsis, one for the East Indian and one for the Mexican and miscellaneous species. We feel sure that we do not exaggerate in the least in saying that Mr. Ames's collection of orchids is one of the finest, and we think it the finest, on this continent, ranking little if any below the largest

and best collections known, and without any doubt it includes more unique and rare specimens than can be seen in any other place. We feel justified in making this statement, as it is based on testimony given by those who have seen all the large collections in the country. To be able to appreciate them one must see them, and it is gratifying to know that visitors are always welcome, and that all who wish may enjoy the pleasure which a visit only can give. Many other things might be properly mentioned; the foliage plants are truly charming; particularly the Crotons, Ferns of luxuriant growth, Aralias, and Palms in the most healthy condition, and some twenty varieties of Nepenthes, or Pitcher Plants as they are popularly called. These superb specimens are grown in baskets suspended from the roof of the house, and are so curious and interesting that attention is at once drawn to them, and they always excite admiration. There is also a large collection of Azaleas; in fact there seems to be nothing lacking that is necessary to make up a choice collection of all the rare and valuable plants found in such places. Neatness and cleanliness are the rule, in the elegant reception room, the glass houses, and the potting room. We have confined this report entirely to the orchids, with a brief mention only of other plants, but we hope that we may have the privilege of speaking to you at some future time of the grounds, where we noticed many rare trees and shrubs.

We desire to express our sincere thanks to Mr. Robinson for his kindness on each of our visits, and for the interesting facts which form a large part of this report. The excellent condition of all the houses and plants gives the most abundant evidence of his skill and ability to execute the trust committed to him.

Strawberry Garden of Samuel Barnard, Belmont.

The second visit of the season was to see the Strawberry Garden of Mr. Barnard, at Belmont. We cannot add anything to our report of last year's visit, except that in all respects the crop was fully equal to that of 1888, and those who had not the privilege of a visit to his grounds, but did attend the Strawberry Exhibition, had the evidence before them, in the exhibits made there, that Mr. Barnard's crops of this fruit are of superior merit; no exhibits from any individual have surpassed his. The strawberry is a welcome fruit, not only on account of its being the earliest of the small fruits, but because it comes within the reach of all, rich and

poor alike. A great deal has been said about strawberries, but not too much. The strawberry has been well termed the "Queen of Small Fruits," and in its improvement size has surely been attained—whether or not at the expense of flavor remains perhaps to be decided. The rage for size in strawberries seems to be quite equal to that for size in other productions. We know that the large berries are captivating to the eye and we frequently hear the exclamation "Did you ever see such berries." We are not surprised that the sight of the large specimens of Sharpless brings forth such expressions. We do not object to size, but if with it we could have the quality which enabled us to say, "What a sweet and delicious berry," the triumph would be much greater. Why cannot some of our strawberry specialists make this a point? It is fair to presume that such a result can be attained. What amateur would not prefer a moderate sized berry, of good color and flavor, to a larger one with less flavor? It is generally acknowledged that all unusually large fruit is deficient in rich flavor, and frequently is very acid, and requires the addition of just about its own weight of sugar to make it palatable. Where are the varieties that have taken the places of the Triumph de Gand, Keens's Seedling, and La Constante—varieties which one could pick from the vines and relish without the aid of sugar? Now if there are defects to remedy and points to be attained, why should we not look to such gentlemen as Mr. Heustis, Mr. Barnard, and others to meet these demands? They have already done much to improve this wholesome and appetizing fruit, and we rejoice with them in the result they have achieved, and that such great success has crowned their efforts; but improvement should still be our ambition, and we will wait patiently but hopefully for still further advances. In this connection we call the attention of growers to the Prospective Prize of $50, offered on page 3 of the Schedule, for the best Seedling Strawberry.

Grounds of Benjamin G. Smith, Cambridge.

July 31st, the Committee visited the grounds of Benjamin G. Smith, on Fayerweather Street, Cambridge. Unfortunately the afternoon was very wet and it was with difficulty that we could see the grounds at all, the only opportunity being a hasty glance between the showers. It is six years since the Committee enjoyed a visit to Mr. Smith. It is not unfrequently the case that in that

length of time many changes take place; often less enthusiasm is manifested, and perhaps the interest of the cultivator is turned in another direction; but we are pleased to say that the evidence given at Mr. Smith's shows an increased interest in the same pursuits. Small fruits command the most attention, the object being to supply the family with good fruit as long as it can be obtained, and, with the apples added to the list, fruit is furnished for the table nearly, if not quite, the year round. It must be remembered that Mr. Smith is not engaged in fruit growing for profit, and the work is accomplished with the help of one man. The cause of his success lies in his love for the work and his commendable enthusiasm in the endeavor to produce the best fruit that culture and skill will give. The results which have been obtained ought to satisfy the most ambitious. The term "small fruits," is well understood as applying to the Strawberry, Raspberry, Currant, and Gooseberry. Their uses for the dessert, and the making of preserves and wines, are of great importance. The Strawberry, already referred to in our report upon Mr. Barnard's garden, is a fruit of great value to the amateur, and several of the best varieties are found here. The Raspberry, so highly prized as a choice table fruit, is very successfully grown. The Currants—Red, White, and Black—also receive good care and attention, the collection comprising the best varieties. Gooseberries have received special attention and Mr. Smith has been very successful with them, of which the fine fruit shown by him from year to year at the Society's exhibitions has given ample proof. Apples, Pears, Quinces, Plums, and Grapes are all successfully grown, and none but the best varieties find a place in the garden.

Ornamental plants and flowers also receive a due share of attention. The Rhododendron bed is healthy and flourishing as is also a good collection of Hybrid Perpetual Roses. A fine assortment of summer bedding plants adds to the attractive appearance of the grounds. In the winter months the conservatory attached to the house is filled with a choice collection of flowering plants, adding very much to the cheerfulness of the library, from which it is entered. To keep up a good supply of plants for the conservatory a small and convenient propagating house has been built during the past season. The cold grapery, which has always been a source of satisfaction to the owner, is still in good order, and no season has passed since the vines commenced bearing, without

the production of a satisfactory crop of fruit. For last year's report, Mr. Smith furnished at our request a list of small fruits which he had successfully grown. This season we take pleasure in adding to this report a letter in which he gives his experience in the cultivation of Hardy Grapes. We are glad that an opportunity has been afforded us to give a second account of Mr. Smith's fruit garden; we only wish there were many more like it and that their owners could enjoy the pleasure and satisfaction of a personal interest in the growth and cultivation of fruits and flowers as he does.

CAMBRIDGE, Nov. 19, 1889.

MY DEAR MR. BARKER:

At your request I briefly note my experience the past season with regard to the cultivation of hardy grapes. The collection covers fifty-five varieties, and I have given them especial attention, in order if possible to ascertain the best dozen varieties to cultivate in Eastern Massachusetts. At the time of the visit of your Committee, July 31, the vines and fruit presented a promising appearance, several varieties being well furnished with large clusters of fruit. The weather during the six weeks following was the most unfavorable for maturing out-door grapes within my recollection.

A superabundance of rain and cold damp weather not only caused mildew but retarded the ripening of the fruit. The grapes arrived at a certain point and did not progress, the fruit being very deficient in grape sugar. Champion, Moore's Early, Cottage, Early Victor, Geneva, Brighton, and Lindley, were the first to ripen and in about the order named. None were up to the usual standard.

This has been a phenomenal year with regard to rain and moisture; therefore cultivators ought not to be discouraged, as such a season may not occur again in twenty years. My experience in laying down and covering the vines for winter protection has proven very satisfactory; this practice I continue until the vines are too large and unyielding to admit it.

Yours sincerely,

BENJAMIN G. SMITH.

NURSERIES OF WILLIAM C. STRONG, NEWTON HIGHLANDS.

August 7th the Committee spent a portion of the afternoon with Mr. W. C. Strong, who is delightfully located at Waban, on

the Boston & Albany Circuit Railroad. For several years Mr. Strong has been busily engaged in laying out the grounds and making streets on a large tract of land, which is being sold in house-lots. Portions of this ground command some of the finest views in Newton. The ease of access to the city from this neighborhood renders it a very desirable place of residence, and with good taste and judgment in laying out the grounds, combined with a judicious planting of trees, all of which the plans for future work assure us will be done, it will be one of Boston's most attractive suburbs.

Mr. Strong has removed his entire nursery stock from Brighton to this place, and in looking it over we found a clean lot of healthy deciduous trees; a good collection of evergreens in a remarkably flourishing condition; and of vines and shrubs, the old and well-known standard varieties, with all the new ones that are desirable and worthy of cultivation. It was very gratifying to see this well ordered nursery so clean and well cared for. In the propagating house many thousands of cuttings of the best shrubs were being rooted, which was to us an evidence that Mr. Strong expects there will be a demand for good and desirable shrubs, and we hope that he will be in the front rank of those who are keeping up the standard of a first-class nursery. Too many are filled with trees and shrubs that are of no use whatever, but we hope the day is near at hand when our home nurseries will be noted for well grown trees and shrubs that are reliable and true to name. Then purchasers can select from the nursery with the assurance and confidence that they are obtaining plants which will afford pleasure and delight as they grow and increase in age and beauty. With such assurance the bitter disappointments which so many have suffered from the captivating but deceptive chromos of the pedler, will no more be feared. Encouragement will take the place of discouragement when people know they are dealing with intelligent and honorable growers, whose statements are based on knowledge gained from experience in their practice and not from the picture or the catalogue alone.

Newton Cemetery.

After leaving Mr. Strong's the Committee paid a visit to this place, which they had visited five years ago. Since that time many improvements have been made, the most conspicuous of which are the Bigelow Mortuary Chapel and Conservatory, both of them

being the munificent gift of one of Newton's public spirited citizens, Hon. John S. Farlow. The Chapel is a memorial to the late Dr. Henry Bigelow, and is situated near the entrance, just north of the Soldiers' Monument. It is the first object that attracts attention after entering the grounds, and is a very handsome piece of stone masonry. The style is pure Gothic, twenty-two by forty-two feet in size, and thirty-eight feet high; it is lighted by stained glass windows in the roof, at each end, and on the left side. The furnishings are of oak; on the right side of the building are three gothic doors opening into the conservatory, which is of handsome design, thirty-five by fifty-four feet on the ground, and twenty-three feet high in the centre. Instead of having the usual straight side-tables and centre stand, it is laid out in artistic style, with rockeries, fountains, waterfalls, etc. Many of the plants being set in the ground are already fine specimens and have grown so large that they reach the roof. Palms and ferns are most conspicuous but there is quite a variety of other choice plants, with Begonias and Lycopodiums to fill up intervening spaces and run over the rockeries. These have taken on a very luxuriant growth and seem to delight in the place they occupy. Two plants of *Musa Cavendishii* with fruit on each were interesting, and there were a number of orchids scattered among the other plants. The roof is partly covered with climbing plants, one of which, *Thunbergia laurifolia*, was very attractive on a visit made December 7. It was the most flourishing plant we had seen and was flowering profusely. The very important improvements which we have described add greatly to the interest of the cemetery, and are highly appreciated by the proprietors and visitors.

As we passed through the grounds we noticed parcels of land that have been put in order and added to the improved parts of the grounds. In all cases these improvements are made on the lawn plan, which has been carried out to good advantage. The largest addition was made this year, by taking in what is known as the "Horrigan lot," which was laid out and planted this fall, adding very much to the breadth and liberal appearance of that part of the grounds lying on the Beacon Street side and just beyond the pond. In the immediate vicinity of the Chapel a new pond has been formed, irregular in shape and supplied by living springs, which in the dryest seasons furnish such an abundance of water as to keep it well filled. Several small islands have been constructed

in the broader part of it, and a rustic bridge crosses at the narrowest point toward the opposite end. On the borders are beds of azaleas and rhododendrons, groups of shrubs and single specimens; also some trees, all which are appropriately planted, making the surroundings of the chapel and conservatory very attractive and interesting.

It is gratifying to notice also that great improvements have been made in planting all through the grounds. At the entrance, trees and choice shrubs have largely taken the place of the usual summer bedding plants. A very pleasing feature is the groups and single specimens of evergreens, of which a very choice collection is here found. These are cheerful at all seasons, especially in winter. The artistic bedding-out is confined to the vicinity of the chapel and conservatory, where it belongs. These changes are delightful to the eye and gratifying to good taste, denoting an era of progress which we are glad to recognize. The usual amount of bedding-out on lots was noticed in mixed and set beds. The condition of the grounds was all that could be expected; choice and rare specimen trees and shrubs — the latter in groups and single plants — greet one at every step. Were we to speak specially of each object that we could with propriety mention we should encroach upon your time and tax your patience too much. But Newton is so near you can get there very easily. Go and see it for yourselves, and you will bear witness that Nature assisted by Art has made this a charming spot. Under the fostering care of Mr. Henry Ross, and Mr. Charles W. Ross, his able assistant, if their plans for the future are successfully carried out the citizens of Newton will have added reason to feel proud of their delightful cemetery, which is not second to any suburban cemetery that we have seen.

Vineyard of Dr. Jabez Fisher, Fitchburg.

September 4, the Committee visited the vineyard of Dr. Fisher, at Fitchburg. For many years he has supplied the Boston market with a very superior quality of fruit, and we are pleased to make a report of his vineyard to the Society. His aim has been in the cultivation of the grape to find out just what is required in fertilization and care to produce the best results.

Dr. Grant of Iona fame said some years ago: "The delight which all fruits of high excellence give, is in only a small degree

measured by the momentary sensation which they communicate to the palate, but their great excellence and power of attraction consist in the animation and vigor which they impart in their refreshing power, and the aid which they give to nourishment. For this, the peach in its perfection is eminent; also the citron melon, and the best pears and apples; but the true grape stands at the head of refreshing fruits, greatly surpassing them all."

We have from the pen of Dr. Fisher, a very full and interesting account of the manner of cultivating and caring for the vineyard, which is of unusually practical value, and is of greater interest than any extended report of the observations of the Committee could be. The healthy and vigorous vines and the even crop of fruit, together with the excellent condition of the vineyard, were highly satisfactory to the Committee.

The following letter gives Dr. Fisher's method:

FITCHBURG, October 5, 1889.

COMMITTEE ON GARDENS:

Gentlemen:— I send you herewith a sample of the grapes taken from my vineyard October 1st, and which you visited September 4th. I do not send "show clusters," but rather those which will give the most satisfaction in the eating, for which these are intended. I wish to ask your assistance in deciding a question in regard to fertilization. My vineyard is divided into three parts, designated as the 1st, 2d, and 3d. One of the three has been fertilized for three years with sulphate of potash among other ingredients, while the other two have had muriate of potash. Sulphate is believed by some to be much better adapted to the production of sugar than muriate. The grapes in the bottom layer of the basket are from Vineyard No. 3; the middle layer from No. 2, and those in the top layer are from No. 1. I have put in No. 1 also some of the girdled grapes which you saw, and which I think were as good September 20th as these which were left until October 1st. You will know them by the larger berries. After you have disposed of them all, please tell me if one layer — omitting the girdled ones — contains to the taste more sugar than either of the others.

This basket is a sample of my way of marketing and I hope may get to you in good order. The quality is not nearly so satisfactory as in a dry and sunny year, nor does the crop handle as well.

Yours truly,

JABEZ FISHER.

The fruit arrived in excellent condition, and while it is true that very many good Concord grapes have been exhibited, there is no doubt whatever that these were the very best that have been shown. The bunches were very even, and the berries of good size and fine color and flavor. The Committee's test of the fruit resulted as follows: — No. 2 is the sweetest; No. 3 next; No. 1 last.

The fruit from the girdled vines was not of as good quality as the others—perhaps on account of being over-ripe.

Dr. Fisher's Statement.

To the Committee on Gardens:

The vineyard to which I have called your attention is situated in the northeast part of the city of Fitchburg, on the southerly descent of Pearl Hill. Its elevation above tide-water is about seven hundred feet. The land slopes gently to the south and east, and contains a little more than three acres. The soil is a deep, strong loam, resting on hard pan underlaid with gneiss rock. A thrifty apple orchard, which I set in 1854, was removed to make room for it.

The vines, which were one year old Concords, were set in the spring of 1871, and since 1872 no other growth has been allowed. The vines were originally placed six feet apart in rows eight feet distant. Some four to six years ago each alternate vine was removed so that now each occupies a space eight by twelve feet. They are trained to a trellis of four wires, the upper one being five feet two inches from the surface, and the others fifteen inches apart. A pair of arms are grown from each vine and trained to the lower wire in opposite directions. The succeeding spring these arms are tied to the second wire, and the upright shoots from them are tied to the third and fourth, while two new arms are trained to the first wire. The upright shoots are stopped at one joint above the upper wire, and all laterals are stopped beyond their first leaf throughout the season. At the autumn pruning all the wood that has borne fruit is cut away, leaving only the two arms upon the bottom wire, which are not allowed to bear.

Cultivation is given by an Acme harrow as often as a crust is formed by rain. No barnyard manure has ever been used, but various commercial fertilizers have been applied annually. The mixture for 1889 was as follows, applied broadcast to each acre, April 13: cotton-seed meal, 220 lbs., muriate of potash, 165 lbs.,

sulphate of ammonia, 58 lbs., nitrate of soda, 22 lbs., South Carolina floats, 55 lbs., and plaster, 80 lbs. In all 600 lbs., in which was contained, 87 lbs. of oxide of potassium, 30 lbs. of nitrogen, and 20 lbs. of phosphoric acid. This cost, aside from labor and cartage, $10.50. The vineyard is divided into three parts. In No. 2, sulphate of potash took the place of the muriate.

When the fruit is as large as peas, all small and imperfect clusters are removed, with enough others to bring the crop down to what my judgment tells me the different vines are likely to carry to perfection; in no case more than twenty lbs. per vine, or four tons to the acre. If more than that is attempted in this part of the state the quality will be poor, and the vines will suffer so much that the following one or two crops will be much inferior in both quantity and quality.

The crop is harvested when fully ripe, which is ordinarily from the fifth to the twelfth of October — this year about the first; and marketed during four to six weeks following.

July 5th I girdled one of the two bearing arms on each of sixty vines by taking out a ring of bark half an inch long near the trunk. As a result, these grapes showed color August 12th, six days before those on the opposite half of the same vines. They were fit for market September 20, the berries being then from thirty to forty per cent larger than the others, and much sweeter. October 1st they still were sweeter than those not treated, which were then ripe, but had a somewhat insipid taste without the refreshing sparkle of those not thus treated. An analysis was made by Professor C. A. Goessman, chemist of the Hatch Experiment Station, which is here given:

September 20th.	Girdled.	Not Girdled.
Moisture, at 100°c.	83.00%	84.69%
Ash	.42	—
Sugar	8.13	6.24
Soda solution to neutralize acid	85.40 c. c.*	75.00 c. c.*
October 1st.		
Moisture at 100°c.	82.69	84.51
Ash	.37	.53
Sugar	8.50	6.09
Soda solution to neutralize acid	50.00 c. c.*	48.00 c. c.*

*Cubic centimetres.

The loss of acid at the second period is the only explanation of the increased sweetness evident to the palate, particularly in those not girdled, and unpleasantly in those girdled. The results of girdling, so far as they are apparent from this trial, show a gain of ten days in fitness for market with largely increased size of berries. The drawbacks are, in a season as wet as the past, a loss of from twenty to forty per cent of the berries by cracking open; berries too soft to bear carriage; both of which would be lessened in a dryer season but not overcome in my experience, and a decided diminution in quality *for connoisseurs*. Add to this the harm which may come to the vine from the operation repeated year after year, but the amount of which is not yet settled.

The vines are pruned preferably as soon as the foliage has dropped, but it may be safely done at any time before the swelling of the buds in spring. The new arms upon the lower wire are allowed to remain through the winter without protection, which, if the wood and roots are thoroughly ripe is unnecessary, and if they are not, is nearly or quite useless.

Insects have done no appreciable injury this season, and although mildew and black rot have both prevailed, yet the loss thereby has not equalled two per cent of the product. JABEZ FISHER.

THE ARNOLD ARBORETUM.

This is always an interesting and instructive place to visit. Go when you will there is something to learn, and very much to see. In our report for the year 1885 your attention was called to the Arboretum; since that time many changes have been made and many new and rare trees and shrubs have been added to the large and choice collection. The readers of "Garden and Forest," more than any other journal have been favored with valuable notes and suggestions from them, which, we are glad to record, are always anxiously looked for and eagerly read on account of their reliable and practical character. The opportunity for obtaining information and instruction in regard to trees and shrubs is unsurpassed, especially if you meet our friend Dawson and are fortunate enough to get him to accompany you around the grounds. On a recent visit we were charmed by a delightful bed of Compositæ which was in the height of beauty when the summer flowering plants were all past. At our request Mr. Dawson has furnished us a statement concerning this bed, which we are sure will be read with interest and profit. Mr. Dawson writes:

"At the Arboretum is a bed of Compositæ, containing seventy-nine species and varieties of Aster, Solidago, Helianthus, Rudbeckia, Pyrethrum, Silphium, Echinacea and others. The massing together of these species of plants makes a display at a time of the year when most other bedding plants are on the wane, and they continue well into the fall after the more tender plants have been destroyed by frost. This kind of bedding should receive more attention, especially on large estates, where many nooks and corners often unsightly could be made things of beauty. In many instances people of wealth go to the sea-side or other summer resorts as soon as the spring flowers are over, and do not return until September or later, when the beauty of the garden is past; now by a judicious planting of these late autumn flowering Compositæ, the autumn garden would be as brilliant as the spring garden, if not more so. Thus by a judicious arrangement of all the spring and autumn blooming plants, each end of the season could be made to vie with the other, and the place would not have the desolate appearance that many gardens present after the first frosts. The cultivation of this class of plants is simple; the main requisites being a good deep well prepared soil, clean culture, securing the taller species by stout stakes to keep them from being broken by the fall gales, and the taking up, dividing, and resetting of the plants every two or three years. Indeed this last operation is necessary with most herbaceous plants when fine blooms are wanted. When they remain too long without change, they are apt to crowd each other, and the flowers are smaller and do not last as well as where the beds are made over and the plants divided and reset every two or three years.

The following are some of the species in the bed at the Aboretum:

Helianthus rigidus,
" *grosse-serratus*,
" *heterophyllus*,
" *doronicoides*,
" *tuberosus*,
" *mollis*,
" *Maximiliani*,
" *strumosus*,
" *decapetalus*,
Actinomeris squarrosa,
Boltonia glastifolia,
" *asteroides*,
Pyrethrum uliginosum,
Silphium perfoliatum,
" *laciniatum*,
" *trifoliatum*,
" *terebinthinaceum*,
Rudbeckia subtomentosa,
" *maxima*,
" *laciniata*,

Rudbeckia grandiflora,
Coreopsis delphinioides,
Achillea Ptarmica,
Chilopsis lævis,
Aster multiflorus,
" *Drummondii*,
" *versicolor*,
" *sagittifolius*,
" *macrophyllus*,
" *umbellatus*,
" *prenanthoides*,
" *æstivus*,
" *lævigatus*,
" *simplex*,
" *spectabilis*,
" *Sibiricus*
" *turbinellus*,
" *Shortii*,
" *amethystinus*,
Aster Novi-Belgii, var.
" *effusus*,
" *puniceus*,
" *Tartaricus*,
" *Tradescanti*,
" *Herveyi*,
" *oblongifolius*,
" *Lindleyanus*,
Solidago lanceolata,
" *arguta*,
" *rugosa*,
" *squarrosa*,
" *Canadensis*,
" *ulmifolia*,
" *sempervirens*,
" *Shortii*,
" *serotina*,
" *Riddellii*,
" *latifolia*.

The Helianthuses, Silphiums, Rudbeckias, and Boltonias, being chiefly tall growing plants, are placed in the background, and the others, according to their height, in the front. This bed has been the admiration of all who have seen it, and the coming season will probably see more of this kind of bedding."

The fruiting shrubs at the Arboretum are among the choicest things to be found there. In a stroll through the grounds in the fall it was delightful to see them so bright and cheerful; we wish that we could speak with trumpet sound so that all could hear our praises of them, and if we had persuasiveness and influence sufficient we should induce every one who plants shrubs to give these varieties a place with others. They show and look best as single specimens, but a skilful landscape-gardener could undoubtedly succeed in making effective groups.

The following list of the most conspicuous kinds will be a guide in making selections. One star indicates those whose fruit drops when frosty weather comes on or a little later; on those marked with two stars the fruit hangs nearly all the season; and those not marked hold their fruit all through the season:

** *Celastrus scandens* and ** *C. articulata* are valuable climbers.

**Ilex lævigata*, and **I. verticillata* are species of a beautiful genus, with deciduous foliage and bright red fruit. **I. glabra* has evergreen foliage and black fruit.

Berberis Sieboldii, ***B. Thunbergii*, *B. Amurensis*, and **B. vulgaris* belong to a very interesting genus of shrubs; their leaves are rich and beautiful; the flowers, which are orange or yellow, are very showy, and are succeeded by bright colored fruit in the fall and winter. *B. Sieboldii* is the gem of the hardy species.

**Rhamnus Frangula* is a fine, robust, hardy shrub, in fruit and flower all the season:

**Euonymus Europæus*—varieties *alba* and *Corsica*—*E. alata*, and *E. Hamiltonianus*, belong to a very interesting genus; the open capsules are very beautiful when other shrubs are losing their beauty.

Rosa rugosa, ***R. multiflora*, *R. repens*, *R. corylifolia*, ***R. tomentosa*, and others.

Ribes alpina and *R. saxatile* are beautiful early-spring flowering shrubs.

**Cornus alba*, *C. sericea*, *C. stolonifera*, *C. paniculata*, *C. alternifolia* and *C. circinata* are all very valuable shrubs and should be extensively grown.

Viburnum dentatum, *V. molle*, ***V. Opulus*, and *V. cassinoides* are all elegant species, somewhat early flowering and quite ornamental.

Lonicera Morrowii, *L. Ruprechtiana*, *L. Xylosteum*, and *L. chrysantha*, of the bush honeysuckles; **L. flava*, **L. Sullivantii*, *L. hirsuta*, and *L. Caprifolium* of the climbing ones are also species of a genus of very ornamental shrubs.

***Symphoricarpus vulgaris* and ***S. racemosus* are very handsome dwarf shrubs producing a quantity of fruit in the autumn.

Symplocos paniculatus has beautiful blue berries.

**Lycium Chinense* is a very pretty climbing shrub.

Eleagnus longipes and *E. umbellatus* are very ornamental shrubs.

***Pyrus arbutifolia*, variety *erythrocarpa*.

This list comprises the most conspicuously fruiting shrubs at the Arboretum, but there are others; for a full and reliable description of those named see several articles in "Garden and Forest," Vol. 2, 1889.

Of late much attention has been bestowed upon the cultivation of Water Lilies; Mr. E. D. Sturtevant of Bordentown, N. J., has for many years made a specialty of them and at several of our

annual exhibitions we have seen his splendid productions. In our vicinity they are successfully grown by Charles M. Atkinson, at John L. Gardner's, Brookline; by James Comley, at Mrs. Francis B. Hayes's, Lexington, and by Frederick L. Harris at H. H. Hunnewell's, Wellesley. We all know that when Mr. Harris speaks it is from practical experience, and we are glad to give you the benefit of that experience from his own pen.

LETTER FROM FREDERICK L. HARRIS.

WELLESLEY, November 29th, 1889.

MR. JOHN G. BARKER,

Dear Sir: — I send you as promised the way in which I manage my Lily Tank. The tank is forty-eight feet long, twelve feet in width, and three feet deep. I fill in with a compost of half-rotted sods to the depth of ten inches, then a sufficient quantity of cow manure to make the depth of soil twelve inches, and add half a barrel of half-inch bone, thoroughly mixing all together. I then put on the water, to the depth of a foot, which is heated to 75° or 80° by four four-inch pipes, two flows and two returns, connected with a boiler in one of our houses. The plants are started in the greenhouse during the month of April so as to have six or eight leaves on each, and about the 15th of May I place them in the tank, taking care to have the water of sufficient depth to cover all the leaves, in order to prevent their being chilled by the cold nights which often occur even up to the first of June. I do not think it wise to put in more than sixteen plants, as before the end of the season they would become too crowded. With me the past season was a very successful one, having given a continuous show of fine flowers from the 15th of June until the 7th of October.

Under favorable circumstances in a naturally well protected location they will flower without the use of artificial means, but our seasons at the best are of short duration, and this comparatively trifling extra expense adds very much to the time we may have them to enjoy. The sorts cultivated are:

Nymphœa alba candidissima,
N. cœrulea,
N. dentata,
N. Devoniensis,
N. Devoniensis, night blooming,
N. Zanzibarensis, blue,
N. " pink,

Many of the flowers when in bloom measured ten inches in diameter and they were a constant source of attraction to the many visitors here.

Early in November the small tubers are preserved by being placed in a tub of water kept at about 60° during the winter.

Hoping the above hints may prove acceptable to you in making up your report, I remain, Dear Sir,

Yours truly,

F. L. Harris.

The following Prizes and Gratuities have been awarded by the Committee: —

To William Robinson, Gardener to Frederick L. Ames, for the best House of Orchids in bloom during the month of March,	$60 00
To Dr. Jabez Fisher, for the best Vineyard,	50 00
Gratuities: —	
To Benjamin G. Smith, for well kept Amateur Garden,	25 00
To Samuel Barnard, for successful cultivation of Strawberries	25 00
To Henry Ross, Superintendent of Newton Cemetery, for well kept grounds, and for artistic laying out and successful improvement of the same,	25 00
To William C. Strong, for successful cultivation of Nursery stock,	25 00
	$210 00

In closing this report we again solicit your coöperation, that we may unitedly be of practical value and assistance not only to each other within the limits of our Society, but to all with whom we are brought in contact, whether through the visits of the Committees, the exhibitions, the reports, or the discussions. Let the Massachusetts Horticultural Society be a thoroughly educational institution. Set the standard high, we can attain to it.

John G. Barker, *Chairman*,
E. W. Wood,
Joseph H. Woodford,
C. N. Brackett,
Henry W. Wilson,
C. W. Ross,

Committee on Gardens.

REPORT

OF THE

COMMITTEE ON WINDOW GARDENING,

FOR THE YEAR 1889.

By MRS. HENRIETTA L. T. WOLCOTT, Chairman.

At the commencement of the year just now drawing to its close, your Committee paused in their work to consider carefully the results of steps taken by them and to discuss new plans for the coming season.

The Treasurer reported a small amount of cash on hand; this presented an opportunity which had been previously mentioned as desirable.

While the contestants in the past had been children, and the prizes small, rumors had been brought to the Committee that there were windows full of flowering plants in fine condition, which might be admitted under the published Schedule of Prizes to competition. In the interests of this class of competitors a few reasonably attractive prizes were offered through the public prints.

Thirteen windows filled with plants were entered and were examined by the Committee. Wishing to secure justice in awarding prizes or certificates of merit, each window was visited by that member of the Committee residing nearest, accompanied by one of the Committee who was chosen to visit each and all.

The variety in the work of each exhibition was marvellous. In one city window, where the conditions usually deemed unfavorable were present, and those considered favorable to the growth of plants were wanting, Geraniums, Palms, Ivies, and two rare Ferns from Ireland were in excellent condition. Many of these

plants had been sunk in the ground in the sunny yard during the summer, for a period of ten years, and returned to the window in the early Fall.

In another window, where seventy pots were exhibited, every plant had been raised either from seed or from slips collected in that hap-hazard way, well-known and practiced by lovers of flowers. Oranges and lemons were growing as thrifty plants.

In another window—the one that received the first prize, a Frost's Microscope, — every one of the seventy plants was in perfect order. Vigorous growth, carefully trained stems of erect or twining plants, freedom from the trace of insects, and tasteful arrangements in very crowded space, attested the skill and industry of the exhibitor.

In one public school-room in the Roxbury district, hundreds of plants, many of them in full bloom, made the visitors wish that they might have studied in company with such beautiful and fragrant flowers.

A collection of one hundred pots in a home in the suburbs, included plants of Pelargonium, Geranium, Ivy, Oxalis, Calla, Tradescantia, Petunia, Palm, Heliotrope, Rose, Verbena, Senecio, and Carnation. Ignoring the plans adopted by the Committee that each plant should be upright and symmetrical, these had been trained toward the glass, thus offering to the traveller a gorgeous display of brilliant blossoms which, contrasted with the deep green of the leaves, made a picture rarely equalled, and in the judgment of the visitors, never excelled.

Considering the educational effect on children, in or out of the family; the stimulus of a prize, even in the neighborhood, the Committee felt authorized to bestow five prizes—books or their equivalent in cash,—and Certificates of Merit with the seal of the Society, on the competitors in Boston, Dorchester, Malden, Roxbury, Chelsea, and West Dedham.

Before special work in the spring commenced, two special prizes were granted for Gloxinias raised from seed and grown in windows, although such prizes were not advertised.

The Committee printed and issued, in response to continued demands for such instruction, a pamphlet containing simple directions as to the preparation of soil and size of pots needed, together with a list of native plants readily found in the suburbs of Boston, which must be considered as the headquarters of the

Committee, while the interest of the main Society should and does cover the whole State.

The letter-press was excellent and the publication was gratefully received in the community. Many hundreds were given to those who purchased plants for themselves or for distribution by the churches; enough were sold to partially defray the expenses incurred by the Committee, and many were sent to the country in response to requests from eager readers.

The seeming narrowness of the list of native plants was emphasized when the Chairman of the Committee addressed a school in Greenfield, Mass., whose friend and pastor had provided plants to be given to the scholars in the sewing school.

In the Fall, prizes in money were awarded to the successful growers.

The exhibitions have been held in different sections of the city according to the advertised programme.

Great improvement over last year's work was manifested in the general appearance of the plants; pots were scrubbed by the little hands, and dead leaves and faded blossoms had been removed, showing that the children had been quick to follow the directions and suggestions made to them by the Chairman and Treasurer. While exhibitors generally brought but one pot, often one or two small children offered several varieties.

Exhibitions of cut native flowers were exceptionally good, when the fact is considered that nearly every child resided in the city proper, and the blossoms had to be gathered after school hours.

Quantities of Solidago in variety, *Aster Novæ-Angliæ* and other plants contributed to the beauty of one display. One lad of ten years of age presented nearly fifty varieties of wild plants labelled by himself.

To one used to the various trials and vicissitudes incident to horticultural exhibitions, when the professional raisers display their results either for their employees or for their own advantage, it was instructive and at the same time amusing to witness the same jealousies evinced, the same anxiety manifested, lest another should bear away the coveted award. To be sure criticisms were not loud or deep, but there were criticisms earnest and saddening, which could, however, be more easily explained away than can be done when the contestants are adults. Outside of the advertised

exhibitions there was one not set down in the plan that deserves notice in this report. Quite late in the season, well after Easter, on which day the plants are given so generally to children of Sunday schools, an application was made to the Chairman for influence to aid in introducing the plan of work into a large Mission School in the city proper. There were over five hundred children in attendance, and the school could secure neither plants nor money. The Committee at that time were in the same condition. With judicious interviewing of two members of the Flower Committee, over three hundred plants were sent to the school to be distributed on Children's Sunday. Hundreds of small bouquets of Ox-eye Daisies (*Chrysanthemum leucanthemum*) and other flowers, which had served to decorate a church in Dedham for their children's services, were grouped on the platform around the plants for distribution.

Included in the services was an address by the Chairman, and one, while distributing plants and pamphlets to the children, by the Treasurer. So earnest were all the teachers that the pastor appointed a special Sunday in the late Fall for awarding the prizes, which work has been done by the Treasurer.

The cordial interest in the work of the Window Garden Committee is by no means confined to our little world.

As one branch of the education of children, cultivating the observing faculties while cultivating the plants, it annually interests a larger circle.

In many places the idea which animated the founders of the Massachusetts Horticultural Society has taken root, and "to promote the love of flowers among the people" is accepted as one of the philanthropic responsibilities of the latter part of the nineteenth century.

Gentlemen and ladies, members of the Massachusetts Horticultural Society, the Treasurer has told you of the financial record of our Committee. It reports a small sum to be returned from your appropriation to the coffers of the Society. Bear with me a moment while I ask you to consider what the Window Garden Committee endeavors to do for these children.

They wish to awaken in their young minds an interest in the evidences of God's love and care and to arouse an appreciation of the effect in the household of a few blossoming plants. So far so good. But one scarcely realizes what a task is set for the child-

ren, unless experience in the same line renders the examiner of the exhibits qualified to decide on the merits or demerits of the plants. Familiarity with the rapid growth when plants are raised under glass, is apt to cause and often does cause an ill concealed contempt for the offerings of the children.

In a majority of cases the plants purchased in large quantities by the churches at Easter have been forced by the florist, as he alone can force them, to reveal the color of their blossoms, often but one blossom, early in the season to attract the buyer. During the following season, provided its daily food and sunshine be secured, the tiny plant may recover and reward the care and patience which it has developed in the owner. But the winter is apt to bring dire disaster. The supply of coal in the cellar gives out; heat is taken away; the open door or window chills the impoverished plant past recovery. Still the hopeful child clings to the idea that by and by the flowers will come, and so brings the stem, ornamented with two or three leaves, for the Committee to pass judgment upon.

Added to this education, which will by and by change the cheerless homes to attractive ones, and so lessen crime, there is another education to be attempted. We may hope to banish from our show windows and from our burial grounds all those atrocities, which under the misnomer of funeral decorations, flood the market and vitiate the taste of the people. Horrid "Gates Ajar," made of the dyed blossoms of Helichrysum, in yellow and purple do *not* simulate, or reveal the Gates of Pearl. Locomotives, butcher's blocks, sections of drain pipe, to decorate the grave of experts in those lines of business are an offense. The figures of animals composed of the sweetest blossoms, do not suggest sweetness to the bereaved family. The love of flowers should be cultivated, but in sweet Charity's name, do not copy mechanical tools to show them.

To stand before the windows of our own members is a delight equal to that felt by some in gazing at a fine picture or a piece of sculpture. The beauty of simplicity in the arrangement of fine flowers is a joy forever. They offer their wares for profit, wisely too; and they are *educating the people* in so doing.

With grateful thanks for the constant support and encouragement given by the honored President, Dr. H. P. Walcott, and

asking for their successors in the work of the Window Gardening Committee as hearty sympathy from his successor, this report is respectfully submitted.

HENRIETTA L. T. WOLCOTT,
EBEN H. HITCHINGS,
ELLEN M. GILL,
S. W. STORY,
HENRY L. CLAPP,
M. B. FAXON,
Committee on Window Gardening.

The receipts and expenditures of the Window Gardening Committee for the year 1889, were as follows:

RECEIPTS.

Cash on hand from 1888,	$33 30	
From Mrs. Bigelow,	50 00	
" Bowker Fertilizer Co.,	50 00	
" Mrs. C. Stedman Hanks,	2 00	
The Society's appropriation,	200 00	
Sale of Window Gardening pamphlets,	142 77	
Sale of Plants,	112 90	
		$590 97

EXPENDITURES.

Window Gardening pamphlets,	189 30	
Plants bought for cash,	109 65	
Labor,	95 50	
Prizes and Gratuities,	51 08	
Stamps,	25 05	
Stationery,	28 50	
Printing,	25 50	
Expressing,	8 85	
Lunch at the September Show,	7 75	
Miscellaneous Expenses,	46 79	
Balance,	3 00	
		$590 97

M. B. FAXON,
Secretary and Treasurer.

REPORT

TO THE

STATE BOARD OF AGRICULTURE,

FOR THE YEAR 1889.

By GEORGE CRUICKSHANKS, of Fitchburg.

The Massachusetts Horticultural Society began the year 1889 with a course of lectures and discussions on subjects connected with the work of the Society, by the following persons:

January 12. The Evolution and Variation of Fruit-plants and their Tendency to Degeneracy when Cultivated, by Joseph H. Bourn, Providence, R. I.

January 19. The Nurseries of Europe, by F. L. Temple, Somerville.

January 26. Mildews, by Professor James E. Humphrey, of the Massachusetts Agricultural Experiment Station, Amherst.

February 2. The Structure and Management of Greenhouses, by William D. Philbrick, Newton Centre.

February 9. Forestry as Applied to Massachusetts, by J. B. Harrison, Franklin Falls, N. H.

February 16. Shrubs that are Perfectly Hardy, by Jackson Dawson, Jamaica Plain.

February 23. The Embellishment of School Grounds, by Leverett M. Chase, Roxbury.

March 2. The Cultivation and Varieties of the Plum, by James F. C. Hyde, Newton.

March 9. Certain Phases of Domestic Economy; Dust and Dampness, by Mrs. Ellen H. Richards, Jamaica Plain.

March 16. Arboriculture and Horticulture as Handmaids of Design, by Charles Eliot, Boston.

March 23. The Cultivation of the Onion, by Hon. James J. H. Gregory, Marblehead.

March 30. Short Papers and Discussions on General Subjects Relating to Horticulture.

These essays and discussions are published in the TRANSACTIONS of the Society, which are free to all its members. The Society appropriated six thousand dollars to be awarded in premiums and gratuities during the year. This Society owns the most complete Horticultural Library in this country; rich especially in illustrated foreign standard works on Botany, Floriculture, and Pomology.

The Society had the misfortune to meet with a heavy loss by fire in their beautiful hall in December last.

The Annual Spring Exhibition opened March 27. It is always a display of great interest to all flower lovers. The upper hall being under repairs on account of the recent fire, the show was held in the lower hall. It comprised the hardy spring flowering bulbs — Hyacinths, Tulips, Lilies, and Narcissus; these bulbs were all well grown, especially the Hyacinths, many of the spikes being very large and fine. The Indian Azaleas were masses of bloom and attracted much attention. Then came that curious family of plants, the Orchids, with their great variety of colors. The Cinerarias were well grown and in fine flower and the show of cut flowers was large and very beautiful. Among the vegetables were fine Lettuce, Radishes, Rhubarb, Asparagus, and Cucumbers—all of excellent quality.

The Rhododendron Show was held one week earlier than the Schedule time on account of the forwardness of the season. On entering the hall the first view of a long table in the centre was one of great beauty. The flowers were of large size, fine form, and in colors from pure white to dark purple and rich crimson. The show of vegetables was large and excellent.

The Rose and Strawberry Show also was held one week earlier than usual. It is fitting that the Rose — the queen of flowers — and the Strawberry — the king of small fruits — should meet on the exhibition table, to receive the praises that are their due. The show of hardy roses was not as large as in the preceding year, but what was lacking in number was made up in beauty of form and richness of colors. A fine group of Tea roses attracted much attention; particularly the pure white Bride, the radiant Mermet, the rosy American Beauty, the sweet scented Niphetos, and the

favorite La France. The Strawberries were of more than usual excellence, many of the varieties being very large and fine.

The Annual Exhibition of this Society has always been looked forward to with great interest by all lovers of the beautiful in plant growth. The newly renovated upper hall was devoted to a choice collection of tropical plants, including crotons, dracænas, lycopods, stately palms, and tall ferns. From the display of wild flowers at the entrance of the upper hall, to the rare orchids which fringed the platform with all their fantastic growths, the visitor was charmed by the great variety of form and color. The tree ferns were all very large and well grown.

In the upper hall was placed a very broad tank filled with a large and choice collection of water lilies, including the different varieties of pink, white, and blue, among them being the lovely night-blooming *Nymphœa Devoniensis*. Altogether the upper hall presented an exquisite picture of floral beauty — one such as is rarely seen even in Horticultural Hall. The lower hall was devoted to fruits and vegetables. The collections of vegetables were very large and all of the finest quality— none overgrown, but all suitable for family use.

Among the grapes were many collections of both native and foreign varieties; one bunch of the latter weighed between nine and ten pounds. The show of apples was not large but was of very superior quality. Of pears many were better than are usually exhibited. The Boscs, Sheldons, and Seckels were worthy of more than a passing notice. Twelve specimens of the last named weighed four pounds and five and one-half ounces, and made the largest and finest dish of that variety which your delegate had ever seen.

The Chrysanthemum Show is always one of the most brilliant exhibitions of the year. The flower has been called the Queen of Autumn and wears her honors with a royal air befitting a plant that in China and Japan has been made the national emblem. All the classes were represented by well grown plants, of all the different colors—white, yellow, purple and the intervening shades. The collections of cut flowers shown in the lower hall have never been surpassed in size, form or color, at any exhibition of this Society. A marked improvement has been made of late years in the exhibits of this Society; a higher standard of excellence in all departments has been attained, which shows the increased skill of the growers.

REPORT

OF THE

COMMITTEE ON THE LIBRARY,

FOR THE YEAR 1889.

The Committee on the Library report, as usual, the expenditure of the Stickney Fund and of the Society's appropriation. The former is applied only to the purchase of books, no part of it being used for periodical publications or for binding.

It brings to this room, year by year, the most desirable of recent publications as well as the most valuable works of older date. Their titles are all printed in the Librarian's report, but it may not be out of place to make special mention of Blanco's "Flora of the Philippine Islands," in five magnificent volumes, with colored plates.

The Society's appropriation suffices for many uses: it purchases our numerous periodicals; it pays for binding; it goes to continue the Card Catalogue of Plates. This Catalogue still grows at the usual rate, though we long since lost the count of its multitudinous thousands of cards. It proves a larger undertaking than we at first expected; so much the more important was it therefore that it should be taken in hand.

The Catalogue of Books and subjects, mentioned in last year's report, was continued up to June of the present year, when the work upon this room compelled its abandonment until such time as the shelf place of the books could be permanently fixed.

We still receive numerous Seed and Plant Catalogues, all of which after lying on the table for a time are put away to be kept as valuable material for the history of horticulture.

The most obvious and important fact in the year's history of the Library is, of course, the addition of the gallery which gives us the book-space for which we have so persistently asked. A glance at its shelves after the re-arrangement of the books will probably remove any doubt (if any there be) that it was needed.

For the Committee,

W. E. ENDICOTT, *Chairman.*

LIBRARY ACCESSIONS.

The measurements of the books in the following lists are in inches and tenths of an inch, giving first the height, next the thickness, and lastly the width. When a pamphlet possesses no measureable thickness the place of that dimension is supplied by a dash.

Books Purchased.

Nicholson, George, A. L. S., *Editor.* The Illustrated Dictionary of Gardening, a Practical and Scientific Encyclopædia of Horticulture for Gardeners and Botanists. Vol. 4, — T to Z, and Supplement. Green cloth, 10.5×1.4×8., pp. viii, 608; colored frontispiece, 259 and 63 cuts. New York: 1889.

Hibberd, Shirley. The Garden Oracle and Floricultural Year Book for 1889. Thirty-first Year. Boards, green, 6.8×.5×4.8, pp. 212; 2 portraits. London: 1889.

Royal Horticultural Society of London. Journal. New Series, Vols. 1, 2, and 3. Parts 1–12. 1866–1873. 9 pamphlets, tea, 8.8×.2–.5×5.5, cuts, plates, diagrams. London: 1866–1873.

Bulletin de la Fédération des Sociétés d'Horticulture de Belgique. For the years 1860 to 1878. 15 vols. Half red morocco, 9.8×.8–1.4×6.3. Gand: 1861–1879.

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Fourth Report. By J. A. Lintner, Ph. D., State Entomologist. Pamphlet, gray, 9.×.6×5.6, pp. 237; 68 cuts. Albany: 1888.

Fifth Report. By J. A. Lintner, Ph. D., State Entomologist. Pamphlet, fawn, 9.1×.6×5.9, pp. 143–348; 50 cuts. Albany: 1889. J. A. Lintner, Entomologist.

New York State Museum of Natural History, Bulletin of the.

No. 5, November, 1888. The White Grub of the May Beetle. By J. A. Lintner, Ph. D., State Entomologist. Pamphlet, blue, 9.1×—×5.8, pp. 31; 5 cuts. Albany: 1888.

No. 6, November, 1888. Cut-worms. By J. A. Lintner, Ph. D., State Entomologist. Pamphlet, blue, 9.×—×5.8, pp. 36; 28 cuts. Albany: 1888. The Author.

United States Department of Agriculture. Division of Entomology. Bulletin No. 20. The Root-Knot Disease of the Peach, Orange, and other plants in Florida, due to the work of Anguillula. Prepared under the direction of the Entomologist, by J. C. Neal, Ph. D., M. D. Pamphlet, tea, 9.1×.2×5.7 pp. 31; 21 plates, colored and plain. Washington: 1889. Hon. J. M. Rusk, Secretary of Agriculture.

—— —— —— — ——. Division of Entomology. Insect Life. Devoted to the Economy and Life-Habits of Insects, especially in their relations to Agriculture. Edited by C. V. Riley, Entomologist, and L. O. Howard, First Assistant, and others. Periodical Bulletin.

Vol. I, Nos. 7–12. Half green morocco, 9.1×1.1×6.2, pp. 201–388; cuts. Washington: 1889.

Vol. II, Nos. 1–6. 6 pamphlets, tea, 9.8×.1×6.2, pp. 197; cuts. Washington: 1889. Hon, J. M. Rusk, Commissioner.

New York Microscopical Society. Journal. Vol. 5, 1889. 4 pamphlets, fawn, 9.3×—×5.9, pp. 119: plates 15–20. New York: 1889. The Society.

Iowa State University. Laboratories of Natural History. Bulletin. Vol. 1, No. 1. Pamphlet, olive, 9.2×.3×6., pp. 96. Iowa City: 1888. S. Calvin and T. H. McBride.

St. Louis Academy of Sciences. Transactions. Vol. 5. Nos. 1 and 2. 1886–1888. Pamphlet, gray, 9.9×.9×6.5, pp. 336, xxix, 16; 9 plates, cuts. St. Louis: 1888. The Academy.

Smithsonian Institution. Fourth Annual Report of the Bureau of Ethnology to the Secretary, 1882–'83, by J. W. Powell, Director. Brown cloth, 11.6×2.2×7.7, pp. lxiii, 532; 83 plates, 564 cuts. Washington: 1886. The Institution.

Ottawa Naturalist. The Transactions of the Ottawa Field Naturalists' Club. Vol. 2, Nos. 7–12; Vol. 3, Nos. 1–3. 6 pamphlets, blue-gray, 9.1×—×6.1. Ottawa: 1888, 1889. W. H. Harrington, Librarian.

Elisha Mitchell Scientific Society. Journal. Vol. 6, Part 1. January–June, 1889. Pamphlet, blue, 8.8×.1×5.7, pp. 40. Raleigh: 1889. The Society.

Leopoldina. Amtliches Organ der Kaiserlichen Leopoldino-Carolinischen Deutschen Akademie der Naturforscher, herausgegeben unter Mitwirkung der Sektionsvorstaende von dem Praesidenten Dr. C.

H. Knoblauch. Vierundzwanzigstes heft. Jahrgang 1888. Pamphlet, blue, 12.5×.3×9.6, pp. 228; 1 plate. Halle: 1888. Dr. C. H. Knoblauch.

Lawrence Free Public Library. Seventeenth Annual Report of the Board of Trustees and Report of the Librarian. 1888. Pamphlet, blue-gray, 9.×—×5.7, pp. 31. Lawrence, Mass.: 1889. Frederick H. Hedge, Jr., Librarian.

Astor Library. Fortieth Annual Report of the Trustees, for the year 1888. Pamphlet, light blue, 9.×.1×5.8, pp. 48. New York: 1889. The Librarian.

New England Historic Genealogical Society. Proceedings at the Annual Meeting, January 2, 1889. Pamphlet, tea, 10.1×.2×6.2, pp. 62. Boston: 1889. The Society.

Wilder, Marshall Pinckney. Memorials. Half dark brown morocco, 9.2×1.×5.9, pp. 216; portrait. Boston: 1889. Mrs. Nancy J. Bigelow.

Minnesota Historical Society, St. Paul. Biennial Report to the Legislature of Minnesota, Session of 1889. Pamphlet, light salmon, 9.2×—×5.9, pp. 40. St. Paul: 1889. The Society.

Kansas State Historical Society. Sixth Biennial Report of the Board of Directors, for the period commencing January 19, 1887, and ending November 20, 1888. Pamphlet, light brown, 9.3×.3×6.1, pp. 128. Topeka: 1889. The Society.

United States Commissioner of Education. Report for the year 1886–87. Black cloth 9.2×2.8.×5.9. pp. 11, 70. Washington: 1888.

Circulars of Information Nos. 2–7, 1888, and No. 1. 1889. 7 pamphlets, tea, 9.×.1—.6×5.9, plates. Washington: 1888, 1889. N. H. R. Dawson, Commissioner.

Bowdoin College. Eighty-seventh and Eighty-eighth Annual Catalogues, for the Academical years 1888–89 and 1889–90. 2 pamphlets, light brown, 9.×.1×5.9, pp. 63 and 61. Brunswick, Maine: 1888, 1889. William DeWitt Hyde, President.

Massachusetts Institute of Technology. President's Report, December 12, 1888. Pamphlet, flesh color, 9.×.1×5.8, pp. 50. Boston: 1888.

——— —— — ——. Twenty-fourth Annual Catalogue of the Officers and Students, with a statement of the Courses of Instruction and a List of the Alumni. 1888–1889. Pamphlet, flesh color, 9.1×.5×5.8, pp. 184. Boston: 1888. The Institute.

Yale University. Report of the President, 1887–88. Pamphlet, gray, 8.8×.1×5.7, pp. 78. New Haven: 1889. The University.

Pennsylvania State College. Catalogue. 1888–89. Pamphlet, tea, 9.1×.2×5.8, pp. 64; frontispiece. State College: 1889. The College.

Illinois University. Fourteenth Report of the Board of Trustees, for the two years ending September 30, 1888. Black cloth, 9.×.8×5.8, pp. 264. Springfield: 1889. William L. Pillsbury, Corresponding Secretary.

United States Consular Reports. No. 97, September 1888, Vol. XXVII, to No. 109, October 1889, Vol. XXXI, inclusive. 15 pamphlets, blue and terra cotta, 9.1×.1—1.×5.8, maps and charts. Washington: 1888, 1889. Hon. Thomas F. Bayard, Secretary of State.

Interstate Commerce Commission. An act to Regulate Commerce. (As amended March 2, 1889.) Pamphlet, 9.×—×5.8, pp. 13. Washington: 1889. The Commission.

Official Congressional Directory for the use of the United States Congress. [Fiftieth Congress.] By W. H. Michael, Clerk of Printing Records. Second edition. Pamphlet, blue, 8.9×.5×5.7, pp. 255; frontispiece, plans, and map. Washington: 1889.

San Diego: The City and the County. Soil, Water Supply, Productions, etc. A pamphlet published and compiled under the Auspices of the Executive Committee of the San Diego Chamber of Commerce, and Citizens. Edited by F. D. Waite. Containing an Article on Climate by R. B. Davy, M. D. Pamphlet, blue, 9.1×.1×5.8, pp. 44; cuts. San Diego: 1888. Frank A. Kimball, Horticultural Commissioner.

United States Department of State. Reports from the Survey of the Boundary between the Territory of the United States and the possessions of Great Britain from the Lake of the Woods to the Summit of the Rocky Mountains, authorized by an Act of Congress approved March 19, 1872. Archibald Campbell, Esq., Commissioner. Captain W. J. Twining, Corps of Engineers, Brevet Major, U. S. A., Chief Astronomer. Green cloth, 12.×2.×9.3, pp. 624; plates, maps and charts. Washington: 1878. Also Atlas, brown paper, 24.×—×16., 24 plates. The Department of State.

Periodicals Purchased.

English. — Gardeners' Chronicle.
Gardeners' Magazine.
Journal of Horticulture and Cottage Gardener.
The Garden.
Gardening Illustrated.
Horticultural Times and Covent Garden Gazette.
Curtis's Botanical Magazine.
Journal of Botany.
Grevillea.

French. — Revue Horticole.
Revue des Eaux et Forêts.
Journal des Roses.

Belgian. — Illustration Horticole.
Revue de l'Horticulture Belge et Étrangère.

German. — Botanische Zeitung.

American.—Country Gentleman.
Garden and Forest.
American Naturalist.
American Journal of Science.

Periodicals Received in Exchange.

Canadian Horticulturist.
American Garden.
Popular Gardening.
Vick's Illustrated Monthly Magazine.
Horticultural Art Journal.
American Florist.
California Florist.
Orchard and Garden.
Green's Fruit Grower.
Fruit and Grape Grower.
Seed-Time and Harvest.
Botanical Gazette.
Journal of Mycology.
West American Scientist.
Maine Farmer.
Mirror and Farmer.
New England Farmer.
Massachusetts Ploughman.
American Cultivator.
New England Homestead.
Our Country Home.
American Agriculturist.
Rural New Yorker.
American Rural Home.
The Farm Journal.
Germantown Telegraph.
Maryland Farmer.
Florida Dispatch, Farmer and Fruit Grower.
Prairie Farmer.
Orange Judd Farmer.
The Industrialist,
Pacific Rural Press.
Boston Daily Advertiser.
Boston Morning Journal.
Boston Post.
Boston Daily Globe.
Boston Evening Transcript.
Boston Daily Evening Traveller.
New York Weekly World.
The Cottage Hearth.

REPORT

OF THE

SECRETARY AND LIBRARIAN

FOR THE YEAR 1889.

The most prominent thing to be noticed in this department during the present year has been the extraordinary calls upon my time in many directions, caused mainly, either directly or indirectly, by the fire in the building last winter. I regret that, owing to what appeared to be more immediately pressing demands, it has been impossible to print the TRANSACTIONS as early as usual. The next part is, however, now in the hands of the printer and will be pushed as rapidly as possible.

As regards the Library, this has been in some respects the most memorable year in its history. We may congratulate ourselves that being at the opposite end of the building from the fire it wholly escaped injury from that calamity, and that we have now, for the first time for many years, sufficient room for new books without crowding. This however has not been effected without adding largely to the labors of the Librarian and his assistant.

I need not say anything of the work of carrying every book and bookcase into the Hall, arranging them there, and then reversing the process, for it must have been apparent to every one. A still greater work yet remains before us, viz., the entire rearrangement of the whole library in a systematic manner, bringing together all the books on the same subject or on kindred subjects. After this we shall have to change all the shelf numbers, both in the books and in the catalogue, the whole forming, as I remarked in my report two years ago, a work of great magnitude, but absolutely necessary to be performed as speedily as possible.

It is well known that the United States government has passed a law, known as the Hatch Experiment Station act, to provide for the establishment of an Agricultural Station in every State and Territory, and appropriating $15,000 yearly for each. Besides these, such stations had previously been established in several States under State laws. As the investigations carried on at these stations relate largely to principles underlying the operations of horticulture, as well as of agriculture, the Library Committee have thought it desirable to procure, if possible, complete sets of all the publications of these stations, and in this we have been reasonably successful, having sets more or less complete of forty-six experiment stations in the United States, besides two in Canada. I wish here to acknowledge the assistance in this work kindly offered by President Goodell of the State Agricultural College, which has been of great value. It should be understood that this work is not, like the arrangement and numbering of the books, one which when once done will not require to be done again for years, but forms a permanent and continuous and by no means a light addition to the labors of those having immediate charge of the Library.

Another event in the history of the Library which should not be passed unnoticed is the reception from the family of our late President, Charles M. Hovey, of one of the largest donations, if not the largest, ever received from one source. The arrangement of these has already involved much work, and will require much more before they are finally disposed of, but I may mention as the most important item forty-seven volumes of the "American Journal of Science." This journal contains many valuable papers on botany by the late Professor Gray and other eminent botanists. The whole set comprises one hundred and thirty-eight volumes, a greater number than in any other set in the Library, and with those above mentioned, and some obtained from other sources, the set wants only twelve volumes (from the 5th to the 16th, inclusive, of the first series) to make it complete, and we are not without hopes of obtaining them. The Hovey gift has also enabled us to perfect our set of the "Country Gentleman," and that of the "American Agriculturist." As intimated above, it has been impossible to make the usual record in detail of this gift, and consequently only a few are mentioned in the list of Library Accessions for the present year, but it is hoped to do this as they are hereafter classified and given permanent places on our shelves.

Concerning the ordinary current work of the Library, I need only say that it has been carried on as well as circumstances would admit, and I think we may congratulate ourselves that the improvements made have been effected without interfering in any greater degree with the use of the Library, either for consultation here or for home reading, and with no loss of books and little injury.

ROBERT MANNING,

Secretary and Librarian.

TREASURER'S REPORT,

FOR THE YEAR 1889.

MASSACHUSETTS HORTICULTURAL SOCIETY *in account current to Dec. 31, 1889, with* W. WYLLYS GANNETT, *Treasurer.*

DR.

1889.			
Dec. 31.	To amount paid balance cost of alterations to store, 100 Tremont St., stated as still due in last report, ...		$3,870 57
	To amount paid total cost of alterations and repairs to building during 1889, details of which have already been submitted to the Society, . . .		15,229 64
	To amount paid cost of repainting portraits of twelve Ex-Presidents, and re-gilding frames for same, ...		2,245 40
	To amount paid for furniture and exhibition ware during 1889, . .		82 53
	To amount paid on account of the Library in 1889, viz:		
	Appropriated and expended for books and binding, .	$300 00	
	Income from "Josiah Stickney Fund," expended for books, ...	700 00	
			1,000 00
Amount carried over, ...			22,428 14

Amount brought over, ...		$22,428 14
To Prizes awarded in 1888— paid during 1889, as follows:		
For Plants and Flowers, .	$2,974 88	
" Fruits, ...	1,535 36	
" Vegetables, . . .	920 00	
" Gardens and Greenhouses,	150 00	
" Hunnewell Rhododendron prizes, . . .	60 00	
" Special Faxon prizes, .	20 00	
" Window Gardening, .	197 00	
		5,857 24
To amount paid for Salaries in 1889, . .		3,175 00
" " Taxes in 1889, . .		2,528 40
" " Interest, on mortgage, $25,000 @ 4½ %, .		1,062 50
" " Insurance, additional in 1889, . . .		319 35
" " City Water rates, .		75 70
" " Stationery, Printing, and Postage, . . .		822 26
" " Publications and Discussions, . . .		206 49
" " Card Catalogue, . .		99 80
" " Expenses of Committee of Arrangements, .		292 20
" " Heating, ...		533 70
" " Lighting, . . .		1,109 18
" " Labor, . . .		1,457 60
" " Incidental Expenses of the year, . . .		510 19
To interest on funds for prizes, credited below, ...		1,842 72
Total payments of 1889, . . .		$42,320 47
To balance account—Cash on hand Dec. 31, 1889, ...		10,620 56
		$52,941 03

Cr.

1889.				
Jan. 1.	By cash received from Geo. W. Fowle, being balance of his account as Treasurer, December 31, 1888, ...			$10,004 56
	By amount collected from insurance companies, for loss by the fire of Dec. 31, 1888, on build'g,	$4,746 92		
	On contents, . . .	5,700 00		
				10,446 92
Dec. 31.	By amount received for mirrors and old furniture sold, ...			245 58
	By amount income from building in 1889, viz:			
	Rent of stores, 1888, $62 50			
	" " 1889, 17,400 00			
		$17,462 50		
	" halls, ...	4,452 00		
				21,914 50
	By amount income from Mount Auburn Cemetery for 1889, . . .			4,322 31
	By amount receipts from Exhibitions, gross amount, . .	$1,450 40		
	Less expenses, . . .	852 82		
				597 58
	By amount from Admissions and Assessments of members, . . .			1,368 00
	By amount Mass. State Bounty, . . .			600 00
	By amount Interest received on bonds, account 1888, $25 00			
	Account 1889, 395 00			
		420 00		
	On deposits in bank, . .	173 36		
				593 36
	By amount received from sales, History of the Society, ...			5 50
	By amount legacy of John Lewis Russell received (the income of which is for an annual lecture on Cryptogamic Botany), . . .			1,000 00
Amount carried over, ...				51,098 31

Amount brought over, ...		$51,098 31
By amount Interest credited to the following Funds, against charges opposite:		
Samuel Appleton Fund, $1,000, @ 5 %, ...	$50 00	
John A. Lowell Fund, $1,000, @ 5 %, ...	50 00	
Theodore Lyman Fund, $11,000, @ 5 %, ...	550 00	
Josiah Bradley Fund, $1,000, @ 5 %, ...	50 00	
Benj. V. French Fund, $500, @ 5 %, ...	25 00	
H. H. Hunnewell Fund, $4,000, @ 5 %, ...	200 00	
Wm. J. Walker Fund, $2,354.43, @ 5 %, ...	117 72	
Levi Whitcomb Fund, $500, @ 5 %, ...	25 00	
Marshall P. Wilder Fund, $1,000, @ 5 %, ...	50 00	
Josiah Stickney Fund, $12,000, amount, ...	700 00	
Benjamin B. Davis Fund, $500, @ 5 %, ...	25 00	
		1,842 72
		$52,941 03

W. WYLLYS GANNETT, *Treasurer.*

Boston, December 31, 1889.

Approved:

H. H. Hunnewell, } *Finance*
Fred. L. Ames, } *Committee.*

MASSACHUSETTS HORTICULTURAL SOCIETY.

Balance Sheet, December 31, 1889.

ASSETS.

Real Estate—Ledger account value,	$250,000 00	
Furniture and Exhibition ware,	3,544 72	
Library,	28,628 72	
Stereotype Plates and Copies of History,	287 50	
Chicago, Burlington and Quincy R. R. 7 % Bonds,	1,500 00	
Illinois Grand Trunk R. R. 8 % Bonds,	500 00	
Chicago, Burlington and Quincy R. R. 4 % Bonds, $5,000—cost,	4,925 00	
Kansas City, Clinton and Springfield R. R. 5 % Bonds, $1,000—cost,	980 00	
Cash on hand December 31, 1889,	10,620 56	
		$300,986 50

LIABILITIES.

Mortgage on Building,	$25,000 00	
Josiah Stickney Fund, payable 1899 to Harvard College,	12,000 00	
Prize Funds invested in Building, viz:		
Samuel Appleton Fund,	$1,000 00	
John A. Lowell "	1,000 00	
Theodore Lyman "	11,000 00	
Benjamin V. French "	500 00	
Josiah Bradley "	1,000 00	
William J. Walker "	2,354 43	
Levi Whitcomb "	500 00	
H. H. Hunnewell "	2,500 00	
John Lewis Russell "	1,000 00	
	20,854 43	
Amount carried over,		57,854 43

Amounts brought over, . . .		$57,854 43	$300,986 50
Prize Funds invested in Bonds, as above, viz:			
H. H. Hunnewell Fund,	$1,500 00		
Benjamin B. Davis "	500 00		
Marshall P. Wilder "	1,000 00		
		3,000 00	
Prizes of 1889 due and unpaid, .		6,000 00	
			66,854 43
Surplus, ...			$234,132 07

W. WYLLYS GANNETT, *Treasurer.*

MEMBERS.

Number of Life Members, per last report, . . .		560	
Added during 1889, ...		19	
Commuted from annual membership, . . .		1	
		580	
Deceased during 1889, ...		7	
			573
Number of Annual Members, per last report, . .		234	
Added during 1889, ...		32	
		266	
Commuted to life membership, . . .	1		
Deceased during 1889, ...	3		
Discontinued during 1889, ...	42		
		46	
			220
Present membership, ...			793

INCOME FROM MEMBERSHIP IN 1889.

19 Life Members, ...	$570 00
32 Annual Members, ...	320 00
1 Commuted to Life, ...	20 00
Assessments, ...	458 00
	$1,368 00

Dr. *Massachusetts Horticultural Society in account with the Proprietors of the Cemetery of Mt. Auburn.* **Cr.**

For Sales and Improvements within the Cemetery for the year ending December 31, 1889.

To Cost of filling up and improving land at Mt. Auburn for the year ending December 31, 1889; the Massachusetts Horticultural Society being charged with their proportion of the same:			By Sales in January,		$470 00
			" " February,		275 00
			" " March,		1,085 00
			" " April,		1,420 00
			" " May,		3,612 00
			" " June,		1,157 50
			" " July,		1,680 00
			" " August,		1,800 00
			" " September,		995 00
			" " October,		3,139 00
			" " November,		1,558 50
			" " December,		1,510 00
					$18,702 00
			Net amount received from Receiving Tomb,		676 00
					$19,378 00
			Less graves repurchased,		55 00
					$19,323 00
			Deduct for Annual Expenses,		1,400 00
					$17,923 00
Glen Avenue,	$428 25				
Birch Avenue to Eagle and Cherry Avenues,	205 50				
	$633 75				
One-quarter of $633.75 is	$158 44				
Balance due Massachusetts Horticultural Society,	4,322 31				
		$4,480 75			
		$4,480 75	Mass. Horticultural Society's one-fourth part of $17,923,		$4,480 75

E. & O. E.

H. B. MACKINTOSH, *Treasurer.*

December 31, 1889.

MASSACHUSETTS HORTICULTURAL SOCIETY

To the PROPRIETORS OF THE CEMETERY OF MOUNT AUBURN, *Dr.*

For one-fourth part of the following expenditures, for grading new lands for sale during the year 1889:

Glen Avenue.

120¾ days, men,	$271 69	
41¾ days, men and horses,	156 56	
		$428 25

Birch Avenue to Eagle and Cherry Avenues.

33 days, men,	$74 25	
35 days, man and horse,	131 25	
		$205 50
		$633 75
One-fourth part of $633.75 is		$158 44

J. W. LOVERING,
Superintendent.

MOUNT AUBURN, December 31, 1889.

I certify the foregoing to be a true copy of improvements for the year 1889, rendered by the Superintendent.

H. B. MACKINTOSH,
Treasurer.

Massachusetts Horticultural Society.

OFFICERS AND STANDING COMMITTEES FOR 1890.

President.

WILLIAM H. SPOONER, of Jamaica Plain.

Vice-Presidents.

CHARLES H. B. BRECK, of Brighton. FREDERICK L. AMES, of North Easton.
BENJAMIN G. SMITH, of Cambridge. NATHANIEL T. KIDDER, of Milton.

Treasurer and Superintendent of the Building.

W. WYLLYS GANNETT, of Cambridge.

Secretary and Librarian.

ROBERT MANNING, of Salem.*

Recording Secretary.

ROBERT MANNING, of Salem.

Professor of Botany and Vegetable Physiology.

JOHN ROBINSON, of Salem.

Professor of Entomology.

SAMUEL H. SCUDDER, of Cambridge.

Standing Committees.

Executive.

THE PRESIDENT, WILLIAM H. SPOONER, CHAIRMAN.
THE CHAIRMAN OF THE FINANCE COMMITTEE, H. H. HUNNEWELL, *EX OFFICIO;*
WILLIAM C. STRONG, HENRY P. WALCOTT, CHARLES H. B. BRECK,
FREDERICK L. AMES, JOHN C. HOVEY, CHARLES S.
SARGENT, BENJAMIN C. CLARK.

* Communications for the Secretary, on the business of the Society, should be addressed to him at Horticultural Hall, Boston.

Finance.

H. HOLLIS HUNNEWELL, Chairman.

FREDERICK L. AMES. WILLIAM H. SPOONER.

Publication and Discussion.

O. B. HADWEN, Chairman.

WILLIAM H. HUNT. FRANCIS H. APPLETON.

Establishing Prizes.

CHAIRMAN OF COMMITTEE ON FRUITS, Chairman.

CHAIRMEN OF COMMITTEES ON PLANTS AND FLOWERS, VEGETABLES, AND GARDENS, *EX OFFICIIS;* CHARLES M. ATKINSON, JOHN C. HOVEY, FREDERICK L. HARRIS.

Library.

WILLIAM E. ENDICOTT, Chairman.

THE PROFESSOR OF BOTANY AND VEGETABLE PHYSIOLOGY AND THE PROFESSOR OF ENTOMOLOGY, *EX OFFICIIS;*

J. D. W. FRENCH. NATHANIEL T. KIDDER.

FRANCIS H. APPLETON. GEORGE W. HUMPHREY.

Gardens.

JOHN G. BARKER, Chairman.

CHAIRMEN OF COMMITTEES ON FRUITS, PLANTS AND FLOWERS, AND VEGETABLES, *EX OFFICIIS;* CHARLES W. ROSS, HENRY W. WILSON, DAVID ALLAN.

Fruit.

E. W. WOOD, Chairman.

BENJAMIN G. SMITH. O. B. HADWEN. SAMUEL HARTWELL.

CHARLES F. CURTIS. WARREN FENNO. J. WILLARD HILL.

Plants and Flowers.

JOSEPH H. WOODFORD, Chairman.

FREDERICK L. HARRIS. ARTHUR H. FEWKES. JOHN H. MOORE.

MICHAEL H. NORTON. WILLIAM J. STEWART. E. H. HITCHINGS.

Vegetables.

CHARLES N. BRACKETT, Chairman.

WARREN HEUSTIS. P. G. HANSON. JOHN C. HOVEY.

CEPHAS H. BRACKETT. VARNUM FROST. CHARLES A. LEARNED.

Committee of Arrangements.

PATRICK NORTON. Chairman.

CHAIRMEN OF COMMITTEES ON FRUITS, PLANTS AND FLOWERS, VEGETABLES, AND GARDENS, *EX OFFICIIS;*

ROBERT FARQUHAR. WILLIAM J. STEWART.

MEMBERS FOR LIFE.

Members of the Society and all other persons who may know of deaths, changes in residence, or other circumstances showing that the following list is inaccurate in any particular, will confer a favor by promptly communicating to the Secretary the needed corrections.

Information, or any clew to it, is especially desired in regard to members whose names are marked thus †.

Adams, Luther, Brighton.
Albro, Charles, Taunton.
Alger, R. F., Becket.
Allan, David, Mount Auburn.
Ames, Frank M., Canton.
Ames, Frederick L., North Easton.
Ames, George, Boston.
Ames, Oliver, Boston.
Ames, Preston Adams, South Hingham.
Amory, Charles, Boston.
Amory, Frederick, Boston.
Anderson, Alexander, West Hingham.
Andrews, Charles L., Milton.
Andrews, Frank W., Washington, D. C.
Andros, Milton, San Francisco, Cal.
Appleton, Edward, Reading.
Appleton, Francis H., Peabody.
Appleton, William S., Boston.
Augur, P. M., Middlefield, Conn.
Avery, Edward, Boston.
Ayling, Isaac, M. D., Waltham.

Bailey, Edwin C., West Stowe, Vt.
Bancroft, John C., Boston.
Banfield, Francis L., M. D., Worcester.
Barber, J. Wesley, Newton.
Barnard, James M., Malden.
Barnard, Robert M., Everett.
Barnard, Samuel, Belmont.
Barnes, Walter S., Somerville.
Barnes, William H., Boston.
†Barney, Levi C., Boston.
Barratt, James, East Pasadena, Cal.
Barrett, Edwin S., Concord.
Bartlett, Edmund, Newburyport.
Bates, Amos, Hingham.
Bates, Caleb, Kingston.
Beal, Alexander, Dorchester.
Beal, Leander, Boston.
Beckford, Daniel R., Jr., Dedham.
†Bell, Joseph H., Quincy.
Berry, James, Brookline.
Bickford, Weare D., Newtonville.
Birchard, Charles, Framingham.
Black, James W., Cambridge.
Blake, Arthur W., Brookline.
Blakemore, John E., Roslindale.
Blanchard, John W., Dorchester.
Blaney, Henry, Salem.
Blinn, Richard D., Chicago, Ill.
Bliss, William, Springfield.
Bocher, Prof. Ferdinand, Cambridge.
Bockus, Charles E., Dorchester.
Bond, George W., Jamaica Plain.
Borland, John N., M. D., New London, Conn.
Botume, John, Wyoming.
Bouvé, Thomas T., Boston.
Bowditch, Azell C., Somerville.
Bowditch, Charles P., Jamaica Plain.
Bowditch, William E., Roxbury.
Bowker, William H., Boston.
Brackett, Cephas H., Brighton.

Brackett, Charles N., Newton.
Bradish, Levi J., Boston.
Bresee, Albert, Hubbardton, Vt.
Brewer, Francis W., Hingham.
Brewer, John Reed, Boston.
†Brigham, William T., Boston.
Brimmer, Martin, Boston.
Brintnall, Benjamin, Charlestown.
Brooks, Francis, West Medford.
Brooks, J. Henry, Milton.
Brown, Alfred S., Jamaica Plain.
Brown, Charles E., Yarmouth, N. S.
Brown, Edward J., Weston.
Brown, George Barnard, Boston.
Brown, George Bruce, Framingham.
Brown, Jacob, Woburn.
Brownell, E. S., Essex Junction, Vt.
Bruce, Nathaniel F., Billerica.
Bullard, John R., Dedham.
Bullard, William S., Boston.
Burnett, Joseph, Southborough.
Burnham, Thomas O. H. P., Boston.
Burr, Fearing, Hingham.
Burr, Matthew H., Hingham
Buswell, Edwin W., Brooklyn, N. Y.
Buswell, Frank E., Brooklyn, N. Y.
†Butler, Aaron, Wakefield.
Butler, Edward K., Jamaica Plain.
Butterfield, William P., East Lexington.

Cabot, Edward C., Brookline.
Cadness, John, Flushing, N. Y.
Cains, William, South Boston.
Calder, Augustus P., Boston.
Capen, John, Boston.
Carlton, Samuel A., Boston.
Carruth, Charles, Boston.
Carter, Miss Sabra, Wilmington.
Cartwright, George, Dedham.
Chadbourne, Marshall W., Watertown.
Chamberlain, Chauncey W., Boston.
Chapin, Nathaniel G., Brookline.
Chapman, Edward, South Framingham.
Chase, Andrew J., Lynn.
Chase, Daniel E., Somerville.
Chase, George B., Boston.
Chase, Hezekiah S., Boston.
Chase, William M., Baltimore, Md.
Cheney, Benjamin P., Boston.
Child, Francis J., Cambridge.
Child, William C., Medford.
Childs, Francis, Charlestown.
Childs, Nathaniel R., Boston.
Choate, Charles F., Cambridge.
Claflin, William, Newtonville.
Clapp, Edward B., Dorchester.
Clapp, James H., Dorchester.
Clapp, William C., Dorchester.
Clark, Benjamin C., Boston.
Clark, Orus, Boston.
Clarke, Miss Cora H., Jamaica Plain.
Clay, Henry, Dorchester.
Cleary, Lawrence, West Roxbury.
Clement, Asa, Dracut.
Cleveland, Ira, Dedham.
Cobb, Albert A., Brookline.
Coburn, Isaac E., Everett.
Codman, Henry Sargent, Brookline.
Codman, James M., Brookline.
Codman, Ogden, Lincoln.
Coffin, G. Winthrop, West Roxbury.
Coffin, William E., Dorchester.
Collamore, Miss Helen, Boston.
Converse, Elisha S., Malden.
Converse, Parker L., Woburn.
Coolidge, Joshua, Mount Auburn.
Copeland, Franklin, West Dedham.
Cowing, Walter H., West Roxbury.
Coy, Samuel I., Boston.
Crosby, George E., West Medford.
Crowell, Randall H., Chelsea.
Crowninshield, Benjamin W., Boston.
Cummings, John, Woburn.
Curtis, Charles F., Jamaica Plain.
Curtis, George S., Jamaica Plain.
Cushing, Robert M., Boston.

†Daggett, Henry C., Boston.
Damon, Samuel G., Arlington.
Dana, Charles B., Wellesley.
Darling, Charles K., Boston.
Davenport, Edward, Dorchester.
Davenport, George E., Medford.

Davenport, Henry, Boston.
Dawson, Jackson, Jamaica Plain.
Day, William F., Roxbury.
Dee, Thomas W., Mount Auburn.
Denny, Clarence H., Boston.
Denton, Eben, Dorchester.
Dewson, Francis A., Newtonville.
Dexter, F. Gordon, Boston.
Dickerman, George H., Somerville.
Dike, Charles C., Stoneham.
Dorr, George, Dorchester.
Dove, George W. W., Andover.
Durant, William, Boston.
Durfee, Mrs. Fidelia B., Fall River.
Durfee, George B., Fall River.
Dutcher, F. J., Hopedale.

Eaton, Horace, Quincy.
†Eldridge, E. H., Roxbury.
Ellicott, Joseph P., Boston.
Elliott, Mrs. John W., Boston.
Elliott, William H., Brighton.
Endicott, William E., Canton.
Eustis, William C., Hyde Park.
Everett, William, Dorchester.

Fairchild, Charles, Boston.
Falconer, William, Glencove, N. Y.
Farlow, John S., Newton.
Farlow, Lewis H., Newton.
Farquhar, Robert, Boston.
†Faxon, John, Quincy.
Fenno, J. Brooks, Boston.
Fewkes, Arthur H., Newton Highlands.
Fisher, David, Montvale.
Fisher, James, Roxbury.
Fisher, Warren, Boston.
Flagg, Augustus, Boston.
Fleming, Edwin, West Newton.
Fletcher, George V., Belmont.
Fletcher, John W., Chelsea.
Fletcher, J. Henry, Belmont.
Flint, David B., Watertown.
Flynt, William N., Monson.
Forster, Edward J., M. D., Charlestown.
Foster, Francis C., Cambridge.
Fottler, John, Jr., Dorchester.
Fowle, George W., Jamaica Plain.
Fowle, William B., Auburndale.
French, Jonathan, Boston.
French, J. D. Williams, Boston.

Galloupe, Charles W., Swampscott.
Galvin, John, West Roxbury.
Gardner, Henry N., Mount Auburn.
Gardner, John L., Brookline.
Gibbs, Wolcott, M.D., Newport, R. I.
Gill, George B., Medford.
Gillard, William, Atlantic.
Gilmore, E. W., North Easton.
Gilson, F. Howard, Reading.
Glover, Albert, Boston.
Glover, Joseph B., Boston.
Goddard, A. Warren, Brookline.
Goddard, Mrs. Mary T., Newton.
Goodell, L. W., Dwight.
Gorham, James L., Jamaica Plain.
†Gould, Samuel, Boston.
Gray, James, Wellesley.
Gregory, James J. H., Marblehead.
Greig, George, Toronto, Ontario.
Grey, Benjamin, Malden.
Grundel, Hermann, Dorchester.
Guild, J. Anson, Brookline.

Hadwen, Obadiah B., Worcester.
Hall, Edwin A., Cambridgeport.
Hall, George A., Chelsea.
Hall, George R., Fort George, Fla.
Hall, John R., Roxbury.
Hall, Lewis, Cambridge.
Hall, Stephen A., Revere.
Hall, William F., Brookline.
Halliday, William H., South Boston.
Hammond, Gardiner G., New London, Conn.
Hammond, George W., Boston.
Hammond, Samuel, Boston.
Hanson, P. G., Woburn.
Harding, Charles L., Cambridge.
Harding, George W., Arlington.
Harding, Lewis B., Stamford, Ct.
Hardy, F. D., Jr., Cambridgeport.
Harrington, Nathan D., Somerville.

Harris, Charles, Cambridge.
Harris, Thaddeus William, A. M., Cambridge.
Hart, William T., Boston.
Hastings, Levi W., Brookline.
Hathaway, Seth W., Marblehead.
Hayes, Daniel F., Exeter, N. H.
Hayes, Mrs. Francis B., Senior, Lexington.
Hayes, Francis B., Lexington.
†Hazeltine, Hazen, Boston.
Hemenway, Augustus, Canton.
Henshaw, Joseph P. B., Boston.
Heywood, George, Concord.
Hilbourn, A. J., Boston.
Hill, George, Arlington.
Hill, John, Stoneham.
Hitchings, E. H., Malden.
Hittinger, Jacob, Belmont.
Hoar, Samuel, Concord.
Hodgkins, John E., Boston.
†Hollis, George W., Grantville.
Hollis, John W., Allston.
Holt, Mrs. Stephen A., Winchester.
Hooper, Thomas, Bridgewater.
Horner, Mrs. Charlotte N.S.,Georgetown.
Horsford, Miss Kate, Cambridge.
Hovey, Charles H., East Pasadena, Cal.
Hovey, John C., Cambridgeport.
Hovey, Stillman S., Woburn.
Hubbard, Charles T., Weston.
Hubbard, Gardner G., Cambridge.
Hubbard, James C., Everett.
Humphrey, George W., Dedham.
Hunnewell, Arthur, Wellesley.
Hunnewell, H. Hollis, Wellesley.
Hunnewell, Walter, Wellesley.
Hunt, Franklin, Boston.
Hunt, William H., Concord.
Hyde, James F. C., Newton Highlands.

Jackson, Charles L., Cambridge.
Jackson, Robert T., Dorchester.
Janvrin, William S., Revere.
Jeffries, John, Boston.
Jenks, Charles W., Boston.
Johnson, J. Frank, Boston.
Jose, Edwin H., Cambridgeport.
Joyce, Mrs. E. S., Medford.

Kakas, Edward, West Medford.
Kelly, George B., Jamaica Plain.
†Kendall, D. S., Woodstock, Ont.
Kendall, Edward, Cambridgeport.
Kendall, Joseph R., San Francisco, Cal.
Kendrick, Mrs. H. P., Allston.
Kennard, Charles W., Boston.
Kennedy, George G., M. D., Milton.
Kent, John, Charlestown.
†Keyes, E. W., Denver, Col.
Keyes, George, Concord.
Kidder, Charles A., Boston.
Kidder, Nathaniel T., Milton.
†Kimball, A. P., Boston.
King, Franklin, Dorchester.
Kingman, Abner A., Brookline.
Kingman, C. D., Middleborough.
Kinney, John M., East Wareham.

Lancaster, Charles B., Newton.
Lane, John, East Bridgewater.
Lawrence, James, Groton.
Lawrence, John, Boston.
Learned, Charles A., Arlington.
Lee, Charles J., Dorchester.
Lee, Henry, Boston.
Leeson, Joseph R., Newton Centre.
Lemme, Frederick, Arlington.
Leuchars, Robert B., Boston.
Lewis, A. S., Framingham.
Lewis, William G., Framingham.
Lincoln, George, Hingham.
Lincoln, Col. Solomon, Boston.
Little, James L., Jr., Brookline.
Locke, William H., Belmont.
Lockwood, Rhodes, Boston.
Loftus, John P., North Easton.
Lord, George C., Newton.
Loring, Caleb W., Beverly Farms.
Loring, George B., Salem.
Lovett, George L., West Newton.

†Lowder, John, Watertown.
Lowell, Augustus, Boston.
Luke, Elijah H., Cambridgeport.
Lumb, William, Boston.
Lunt, Charles H., Jamaica Plain.
Lyman, Theodore, Brookline.
Lyon, Henry, Charlestown.

†Mahony, John, Boston.
Mann, James F., Ipswich.
Mann, Jonathan, Milton.
Manning, Jacob W., Reading.
Manning, Mrs. Lydia B., Reading.
Manning, Robert, Salem.
Manning, Warren H., Reading.
Marshall, Frederick F., Chelsea.
Martin, John S., Roxbury.
Matthews, Nathan, Boston.
McCarty, Timothy, Providence, R. I.
McClure, John, Revere.
McWilliam, George, Whitinsville.
Melvin, James C., West Newton.
Merriam, Herbert, Weston.
Merriam, M. H., Lexington.
Merrifield, William T., Worcester.
Merrill, Hon. Moody, Roxbury.
Metivier, James, Cambridge.
†Milmore, Mrs. Joseph, Boston.
Minton, James, Boston.
Moore, John H., Concord.
Morrill, Joseph, Jr., Roxbury.
†Morse, Samuel F., Boston.
Morse, William A., Natick.
Motley, Thomas, Jamaica Plain.
Mudge, George A., Portsmouth, N.H.
Monroe, Otis, Boston.

Needham, Daniel, Groton.
Nevins, David, Framingham.
Newman, John R., Winchester.
Newton, Rev. William W., Pittsfield.
Nickerson, Albert W., Marion.
Nickerson, George A., Dedham.
Norton, Charles W., Allston.
Nourse, Benjamin F., Boston.

Oakman, Hiram A., North Marshfield.
Osgood, James Ripley, Boston.

Packer, Charles H., Boston.
Page, Thomas, Hinsdale, Ill.
Paige, Clifton H., Boston.
Palmer, Julius A., Jr., Boston.
Parker, Augustus, Roxbury.
Parkman, Francis, Jamaica Plain.
†Partridge, Henry, Dunkirk, N. Y.
Partridge, Horace, North Cambridge.
Paul, Alfred W., Dighton.
Peabody, John E., Salem.
Peabody, Col. Oliver W., Milton.
Pearce, John, West Roxbury.
Peck, Lucius T., Dorchester.
Peck, O. H., Denver, Col.
Peck, William G., Arlington.
Peirce, Silas, Boston.
Penniman, A. P., Waltham.
Perkins, Augustus T., Boston.
Perkins, Edward N., Jamaica Plain.
Perkins, William P., Wayland.
†Perry, George W., Malden.
Philbrick, William D., Newton Centre.
Pierce, Dean, Brookline.
Pierce, Henry L., Boston.
Pierce, Samuel B., Dorchester.
Plumer, Miss Mary N., Salem.
Poor, John R., Boston.
Porter, Herbert, Malden.
Potter, Joseph S., Arlington.
Prang, Louis, Roxbury.
Pratt, Laban, Dorchester.
Pratt, Lucius G., West Newton.
Pratt, Robert M., Boston.
Pratt, William, Winchester.
Pray, Mark W., Boston.
†Prescott, Eben C., Boston.
†Prescott, William G., Boston.
Prescott, William G., Quincy.
Pringle, Cyrus G., Charlotte, Vt.
Proctor, Thomas P., Jamaica Plain.
Prouty, Gardner, Littleton.
Putnam, Joshua H., Brookline.

Quinby, Hosea M., M.D., Worcester.

Rand, Miss Elizabeth L., Newton Highlands.
Rand, Harry S., North Cambridge,
Rand, Oliver J., Cambridgeport.

Rawson, Warren W., Arlington.
Ray, James F., Franklin.
Ray, James P., Franklin.
Ray, Joseph G., Franklin.
Reed, George W., Boston.
Rice, George C., Worcester.
Richards, John J., Boston.
Richardson, Charles E., Cambridgeport.
Rinn, J. Ph., Boston.
Ripley, Charles, Dorchester.
Robbins, I. Gilbert, Wakefield.
Robeson, William R., Boston.
Robinson, John, Salem.
Robinson, Joseph B., Allston.
Ross, Henry, Newtonville.
Ross, M. Denman, Forest Hills.
Ross, Waldo O., Boston.
Ruddick, William H., M. D., South Boston.
Russell, George, Woburn.
Russell, John E., Leicester.
Russell, Walter, Arlington.

Sampson, George R., London, England.
Sanford, Oliver S., Hyde Park.
Sargent, Charles S., Brookline.
Sargent, John O., Lenox.
Saville, Richard L., Brookline.
Sawtelle, Eli A., Boston.
Sawyer, Timothy T., Charlestown.
†Scott, Charles, Newton.
Scudder, Charles W., Brookline.
Sears, J. Montgomery, Boston.
Seaver, Nathaniel, East Boston.
Shaw, Christopher C., Milford, N. H.
Shimmin, Charles F., Boston.
Shorey, John L., Lynn.
Skinner, Francis, Boston.
Smith, Benjamin G., Cambridge.
Smith, Calvin W., Grantville.
Smith, Charles H., Jamaica Plain.
Smith, Charles S., Lincoln.
Smith, Chauncey, Cambridge.
Smith, Edward N., San Francisco.
Smith, George O., Boston.
Smith, James H., Needham.
Smith, Thomas Page, Waltham.
Snow, Eben, Cambridge.
Snow, Miss Salome H., Brunswick, Me.
Sparhawk, Edward C., Brighton.
Spaulding, Edward, West Newton.
Speare, Alden, Newton Centre.
Springall, George, Malden.
Stetson, Nahum, Bridgewater.
Stewart, William J., Winchester.
Stickney, Rufus B., Somerville.
†Stimpson, George, New York, N. Y.
Stone, Amos, Everett.
Stone, Charles W., Boston.
Stone, George F., Chestnut Hill.
Stone, Phineas J., Charlestown.
Strong, William C., Newton Highlands.
Sturgis, Russell, Manchester.
Sturtevant, E. Lewis, M. D., South Framingham.
Surette, Louis A., Concord.

Taft, John B., Cambridge.
Tarbell, George G., M. D., Boston.
Taylor, Horace B., Boston.
Temple, Felker L., Somerville.
Thurlow, Thomas C., West Newbury.
Tidd, Marshall M., Woburn.
Tilton, Stephen W., Roxbury.
Todd, John, Hingham.
Tolman, Benjamin, Concord.
†Tolman, Miss Harriet S., Boston.
Torrey, Everett, Charlestown.
Tufts, Arthur W., Roxbury.
†Turner, John M., Dorchester.
Turner, Roswell W., Dorchester.
Turner, Royal W., Randolph.

Underwood, William J., Belmont.

Vinal, Miss Mary L., Somerville.

Wainwright, William L., Braintree.
Wakefield, E. H., Cambridge.

Walcott, Henry P., M.D., Cambridge.
Wales, George O., Braintree.
Walker, Edward C. R., Roxbury.
Walley, Mrs. W. P., Boston.
Walton, Daniel G., Wakefield.
Ward, John, Newton Centre.
Ward, Francis Jackson, Roxbury.
Wardwell, William H., Boston.
Ware, Benjamin P., Clifton.
Warren, George W., Boston.
Washburn, Andrew, Hyde Park.
Waters, Edwin F., Boston.
Waters, George F., Boston.
Watson, Benjamin M., Jr., Jamaica Plain.
Watson, Thomas A., East Braintree.
Watts, Isaac, Waverly.
Webber, Aaron D., Boston.
Weld, Christopher Minot, Jamaica Plain.
Weld, George W., Newport, R. I.
Weld, Moses W., M. D., Boston.
Weld, Richard H., Boston.
Weld, William G., Boston.
West, Mrs Maria L., Neponset.
Weston, Leonard W., Lincoln.
Weston, Seth, Revere.
Wheeler, Frank, Concord.
Wheelwright, A. C., Brookline.
Whipple, John A., Boston.
Whitcomb, William B., Medford.
White, Edward A., Boston.
White, Francis A., Brookline.
White, Joseph H., Brookline.
†Whitely, Edward, Cambridgeport.
Whittle, George W., Westminster, Vt.
†Whytal, Thomas G., New York, N.Y.
Wilbur, George B., West Newton.
Wilder, Edward Baker, Dorchester.
Wilder, Henry A., Malden.
Willard, E. W., Newport, R. I.
Willcutt, Levi L., West Roxbury.
Williams, Aaron D., Boston.
Williams, Benjamin B., Boston.
Williams, Philander, Taunton.
Willis, George W., Chelsea.
Willis, Joshua C., Roxbury.
Wilson, Col. Henry W., Boston.
Wilson, William Power, Boston.
Woerd, Charles V., Waltham.
Wood, Charles G., Boston.
Wood, Luke H., Marlborough.
Wood, R. W., Jamaica Plain.
Wood, William K., West Newton.
Woods, Henry, Boston.
Woodward, Royal, Brookline.
Wright, George C., West Acton.
Wyman, Oliver B., Shrewsbury.

ANNUAL MEMBERS.

Members of the Society and all other persons who may know of deaths, changes of residence, or other circumstances showing that the following list is inaccurate in any particular, will confer a favor by promptly communicating to the Secretary the needed corrections.

Abbot, Samuel L., M. D., Boston.
Abbott, Allen V., Boston.
Allen, Charles L., Floral Park, N. Y.
Andrews, Augustus, Dorchester.
Arnold, Mrs. Anna E., Newton.
Atkinson, Charles M., Brookline.
Atkinson, Edward, Brookline.
Atkinson, William B., Newburyport.

Bacon, Augustus, Roxbury.
Badlam, William H., Dorchester.
Bard, James, Dorchester.
Barker, John G., Jamaica Plain.
Benedict, Washington G., Boston.
Beard, Edward L., Cambridge.
Beer, Carl, Bangor, Maine.
Bigelow, Arthur J., Marlborough.
Bird, John L., Dorchester.
Bliss, Benjamin K., East Bridgewater.
Bock, William A., North Cambridge.
Bolles, Matthew, Boston.
Bolles, William P., Roxbury.
Bolton, John B., Somerville.
Bowditch, E. F., Framingham.
Bowditch, James H., Brookline.
Bowker, Albert, East Boston.
Boyden, Clarence F., Taunton.
Breck, Charles H., Brighton.
Breck, Charles H. B., Brighton.
Brooks, George, Brookline.
Brown, David H., West Medford.
Burley, Edward, Beverly.
Butler, Edward, Wellesley.

Carroll, James T., Chelsea.
Carter, Miss Maria E., Woburn.
Carter, Mrs. Sarah D. J., Wilmington.
Chaffin, John C., Newton.
Chase, Joseph S., Malden.
Chase, Leverett M., Roxbury.
Cheney, Amos P., Natick.
Clapp, Henry L., Roxbury.
Clark, Joseph, Manchester.
Clark, Theodore M., Newtonville.
Collins, Frank S., Malden.
Comley, James, Lexington.
Coolidge, David H., Jr., Boston.
Crafts, William A., Boston.
Crosby, J. Allen, Jamaica Plain.
Curtis, Daniel T., Sharon.
Curtis, Joseph H., Boston.

Davenport, Albert M., Watertown.
Davis, Frederick, Saxonville.
Davis, Frederick S., West Roxbury.
Davis, Thomas M., Cambridgeport.
De Mar, John A., Brighton.
Dolbear, Mrs. Alice J., College Hill.
Doliber, Thomas, Brookline.
Doran, Enoch E., Brookline.
Doyle, William E., East Cambridge.
Duffley, Daniel, Brookline.

Eaton, Jacob, Cambridgeport.
Endicott, Miss Charlotte M., Canton.

Faxon, Edwin, Jamaica Plain.
Faxon, Marshall B., Boston.
Felton, Arthur W., West Newton.
Fenno, Warren, Revere.
Fisher, Sewall, Framingham.
Forbes, William H., Jamaica Plain.

Foster, Joshua T., Medford.
Frohock, Roscoe R,, Malden.
Frost, Artemas, Belmont.
Frost, George, West Newton.
Frost, Stiles, Newtonville.
Frost, Varnum, Belmont.
Frost, Warren S., Belmont.
Fuller, T. Otis, Needham.

Gibbon, Mrs. James A., Brookline.
Gilbert, Samuel, Boston.
Gill, Mrs. E. M., Medford.
Gleason, Herbert, Malden.
Goddard, Thomas, Boston.
Gould, William P., Boston.
Grant, Charles E., Concord.
Grover, William O., Boston.
Guerineau, Louis, Cambridge.

Hall, Charles H., M. D., Cambridgeport.
Hall, Stacy, Boston.
Hall, William T., Revere.
Hamlin, Delwin A., Allston.
Hammond, Clement M., Hyde Park.
Hanks, Mrs. C. Stedman, Boston.
Hargraves, William J., Jamaica Plain.
Harris, Miss Ellen M., Jamaica Plain.
Harris, Frederick L., South Natick.
Hartwell, Samuel, Lincoln.
Harwood, George S., Newton.
Hersey, Alfred H., Hingham.
Hersey, Edmund, Hingham.
Heustis, Warren, Belmont.
Hews, Albert H., North Cambridge.
Hill, Benjamin D., Peabody.
Hill, Edwin S., Clarendon Hills.
Hill, J. Willard, Belmont.
Hobbs, George M., Boston.
Hollis, George, South Weymouth.
Houghton, George S., Auburndale.
Hunt, Henry C., Newton.
Huston, Miss Katharine W., Roxbury.

Jameson. G. W., East Lexington.
Jordan, Hon. Jediah P., Roxbury.
Judkins, Rev. B., West Dedham.

Kendall, Jonas, Framingham.
Kenrick, Miss Anna C., Newton.
Kidder, Francis H., Medford.

Lamprell, Simon, Marblehead.
Lancaster, Mrs. E. M., Roxbury.
Lang, John H. B., Boston.
Langmaid, Mrs. Mary, Somerville.
Lawrence, Henry S., Roxbury.
Lawrence, Sidney, East Lexington.
Lee, Francis H., Salem.
Lombard, Richard T., Jamaica Plain.
Loring, Charles G., Boston.
Loring, John A., North Andover.
Lothrop, David W., West Medford.
Lothrop, Thornton K., Boston.
Loud, Mrs. Mary E., Chelsea.
Lougee, Miss Susan C., Chelsea.
Low, Aaron, Essex.
Lowell, John, Newton.

Manda, W. A., Short Hills, N. J.
Manning, J. Woodward, Reading.
Markoe, George F. H., Roxbury.
Martin, William J., Milton.
Maxwell, Charles E., Boston.
May, F. W. G., Boston.
McDermott, Andrew, Roxbury.
McIntosh, Aaron S., Roxbury.
McLaren, Anthony, Forest Hills.
McMillan, Robert, Pearl River, N. Y.
Meriam, Horatio C., D.M.D., Salem.
Meston, Alexander, Andover.
Morandi, Francis W., Malden.
Muzzey, Rev. Artemas B., Cambridge.

Nightingale, Rev. Crawford, Dorchester.
Norton, Michael H., Boston.
Norton, Patrick, Boston.

Olmsted, Frederick Law, Brookline.

Park, William D., Boston.
Parker, George A., Halifax.
Parker, John, Medford.
Payson, Samuel R., Boston.

Peirce, George H., Concord.
Peirce, Herbert H. D., Cambridge.
Petremant, Robert, Dorchester.
Pitcher, James R., Short Hills, N. J.
Plimpton, Willard P., West Newton.
Power, Charles J., South Framingham.
Prichard, Joseph V., Boston.
Purdie, George A., Wellesley Hills.
Putnam, Charles A., Salem.

Randall, Macey, Sharon.
Rich, William E. C., Roxbury.
Rich, William P., Chelsea.
Richards, John S., Brookline.
Richards, Mrs. P. D., West Medford.
Richardson, Horace, M. D., Boston.
Robbins, Oliver R., Weston.
Robinson, William, North Easton.
Rogers, Samuel C. B., Jamaica Plain.
Ross, Charles W., Newtonville.

Safford, Nathaniel F., Milton.
Saunders, Miss Mary T., Salem.
Sawtell, J. M., Fitchburg.
Schmitt, Georg A., Boston.
Scott, Augustus E., Lexington.
Scott, John W., Nahant.
Scudder, Samuel H., Cambridge.
Seaver, Edwin P., LL. D., Newton Highlands.
Sharples, Stephen P., Cambridge.
Shattuck, Frederick R., Roxbury.
Shedd, Abraham B., Waltham.
Sheppard, Edwin, Lowell.
Snow, Eugene A., Melrose.
Snow, Francis B., Dorchester.
Southworth, Edward, Quincy.
Spencer, Aaron W., Boston.
Spooner, William H., Jamaica Plain.
Squire, Miss Esther A., North Cambridge.
Squire, John P., Arlington.
Stearns, Mrs. Charles A., East Watertown.
Stearns, Charles H., Brookline.
Stone, Samuel G., Charlestown.
Storer, Charles, Natick.
Story, Miss Sarah W., Brighton.
Strahan, Thomas, Chelsea.
Stults, John V. N., Roxbury.
Swan, Charles W., M. D., Boston.

Tailby, Joseph, Wellesley.
Talbot, Josiah W., Norwood.
Teel, William H., West Acton.
Terry, Rev. Calvin, North Weymouth.
Tobey, S. Edwin, Boston.
Torrey, Bradford, Boston.
Tousey, Prof. William G., College Hill.
Turner, Nathaniel W., Boston.

Vaughan, J. C., Chicago, Ill.

Walker, Joseph T., Watertown, N.Y.
Walker, William P., Somerville.
Way, John M., Roxbury.
Welch, Patrick, Dorchester.
Wellington, Miss Caroline, East Lexington.
Wells, Benjamin T., Newton.
Weston, Mrs. L. P., Danvers.
Wheatland, Henry, M. D., Salem.
Wheeler, James, Brookline.
White, George A., Roxbury.
Whitney, Joel, Winchester.
Whiton, Starkes, Hingham Centre.
Whittier, Hon. Charles, Roxbury.
Wilmarth, Henry D., Jamaica Plain.
Wilson, B. Osgood, Watertown.
Wilson, George W., Malden.
Winter, William C., Mansfield.
Wolcott, Mrs. Henrietta L. T., Dedham.
Wood, Mrs. Anna D., West Newton.
Wood, E. W., West Newton.
Woodford, Joseph H., Newton.
Worthington, Roland, Roxbury.

Young, E. Bentley, Boston.

Zirngiebel, Denys, Needham.

EXTRACTS FROM THE CONSTITUTION AND BY-LAWS.

SECTION XXVI. — Life Members.

The payment of thirty dollars shall constitute a Life Membership, and exempt the member from all future assessments; and any member having once paid an admission fee may become a Life Member by the payment of twenty dollars in addition thereto.

SECTION XXVII. — Admission Fee and Annual Assessment.

Every subscription member, before he receives his diploma, or exercises the privileges of a member, shall pay the sum of ten dollars as an admission fee, and shall be subject afterwards to an annual assessment of two dollars.

SECTION XXIX. — Discontinuance of Membership.

Any member who shall neglect for the space of two years to pay his annual assessment shall cease to be a member of the Society, and the Treasurer shall erase his name from the List of Members. Any member may withdraw from the Society, on giving notice to the Treasurer and paying the amount due from him to the Society.

The attention of Annual Members is particularly called to Section XXIX.

HONORARY MEMBERS.

Members and correspondents of the Society and all other persons who may know of deaths, changes of residence, or other circumstances showing that the following list is inaccurate in any particular, will confer a favor by promptly communicating to the Secretary the needed corrections.

Information or any clew to it, is especially desired in regard to Joseph Maxwell, *elected in* 1830, *and* George W. Smith, *elected in* 1851. *The names of those known to be deceased are marked with a star.*

*Benjamin Abbott, LL. D., Exeter, N. H.
*John Abbott, Brunswick, Me.
*Hon. John Quincy Adams, LL. D., late President of the United States, Quincy.
*Professor Louis Agassiz, Cambridge.
*William T. Aiton, late Curator of the Royal Gardens, Kew, England.
*Thomas Allen, late President of the St. Louis Horticultural Society, St. Louis, Mo., and Pittsfield, Mass.
*Hon. Samuel Appleton, Boston.
*Hon. James Arnold, New Bedford.
*Edward Nathaniel Bancroft, M. D., late President of the Horticultural and Agricultural Society of Jamaica.
*Hon. Philip P. Barbour, Virginia.
*Don Angel Calderon de la Barca, late Spanish Minister at Washington.
*Robert Barclay, Bury Hill, Dorking, Surrey, England.
*James Beekman, New York.
*L'Abbé Berlèse, Paris.
*Nicholas Biddle, Philadelphia.
*Dr. Jacob Bigelow, Boston.
*Mrs. Lucy Bigelow, Medford.
*Le Chevalier Soulange Bodin, late Secrétaire Général de la Société d'Horticulture de Paris.
Hon. George S. Boutwell, Groton.
*Josiah Bradlee, Boston.
*Hon. George N. Briggs, Pittsfield.
*Hon. James Buchanan, late President of the United States, Lancaster, Penn.
*Hon. Jesse Buel, late President of the Albany Horticultural Society, Albany, N. Y.
*Hon. Edmund Burke, late Commissioner of Patents, Washington, D. C.

*Augustin Pyramus de Candolle, Geneva, Switzerland.
*Hon. Horace Capron, late U. S. Commissioner of Agriculture, Washington, D. C.
*Commodore Isaac Chauncey, U. S. Navy, Brooklyn, N. Y.
*Ward Chipman, late Chief Justice of New Brunswick, St. John.
*Lewis Clapier, Philadelphia.
*Hon. Henry Clay, Lexington, Ky.
H. W. S. Cleveland, Minneapolis, Minn.
*Admiral Sir Isaac Coffin, Bart., England.
*Zaccheus Collins, late President of the Pennsylvania Horticultural Society, Philadelphia.
*Roswell L. Colt, Paterson, N. J.
*Caleb Cope, Ex-President of the Pennsylvania Horticultural Society, Philadelphia.
*William Coxe, Burlington, N. J.
*John P. Cushing, Watertown.
*Charles W. Dabney, late U. S. Consul, Fayal, Azores.
*Hon. John Davis, LL. D., Boston.
*Sir Humphry Davy, London.
*Gen. Henry Alexander Scammel Dearborn, Roxbury.
*James Dickson, late Vice-President of the Horticultural Society of London.
*Mrs. Dorothy Dix, Boston.
*Capt. Jesse D. Elliot, U. S. Navy.
*Hon. Stephen Elliot, LL. D., Charleston, S. C.
*Hon. Henry L. Ellsworth, late Commissioner of Patents, Washington, D. C.
*Allyn Charles Evanson, late Secretary of the King's County Agricultural Society, St. John, N. B.
*Hon. Edward Everett, LL. D., Boston.
*Hon. Horace Everett, Vermont.
*F. Faldermann, late Curator of the Imperial Botanic Garden, St. Petersburg.
*Hon. Millard Fillmore, late President of the United States, Buffalo, N.Y.
*Dr. F. E. Fischer, late Professor of Botany at the Imperial Botanic Garden, St. Petersburg, Russia.
*Hon. Theodore Frelinghuysen, late President of the American Agricultural Society, New Brunswick, New Jersey.
*Joseph Gales, Jr., late Vice-President of the Horticultural Society, Washington, D. C.
*George Gibbs, New York.
*Stephen Girard, Philadelphia.
*Hon. Robert T. Goldsborough, Talbot County, Maryland.
*Ephraim Goodale, South Orrington, Maine.
*Mrs. Rebecca Gore, Waltham.
*Hon. John Greig, late President of the Domestic Horticultural Society Canandaigua, N. Y.

*Mrs. Mary Griffith, Charlieshope, N. J.
*Gen. William Henry Harrison, late President of the United States, North Bend, Ohio.
*S. P. Hildreth, M. D., Marietta, Ohio.
*Thomas Hopkirk, late President of the Glasgow Horticultural Society.
*David Hosack, M. D., late President of the New York Horticultural Society.
*Lewis Hunt, Huntsburg, Ohio.
*Joseph R. Ingersoll, late President of the Pennsylvania Horticultural Society, Philadelphia.
*Gen. Andrew Jackson, late President of the United States, Nashville, Tenn.
*Mrs. Martha Johonnot, Salem.
*Jared Potter Kirtland, M. D., LL.D., East Rockport, Ohio.
*Thomas Andrew Knight, late President of the Horticultural Society of London.
*Gen. La Fayette, La Grange, France.
*Le Comte de Lasteyrie, late Vice-President of the Horticultural Society of Paris.
Major L. A. Huguet-Latour, M. P., Montreal, Canada.
*Baron Justus Liebig, Giessen, Germany.
*Professor John Lindley, late Secretary of the Horticultural Society of London.
*Franklin Litchfield, late U. S. Consul at Puerto Cabello, Venezuela.
*Joshua Longstreth, Philadelphia.
*Nicholas Longworth, Cincinnati, Ohio.
*Jacob Lorillard, late President of the New York Horticultural Society.
*John Claudius Loudon, London.
*Hon. John A. Lowell, Boston.
*Baron Charles Ferdinand Henry Von Ludwig, late Vice-President of the South African Literary and Scientific Institution, Cape Town, Cape of Good Hope.
*Hon. Theodore Lyman, Brookline.
Col. Theodore Lyman, Brookline.
*Hon. James Madison, late President of the United States, Montpelier, Va.
*Mrs. Charlotte Maryatt, Wimbledon, near London.
Joseph Maxwell, Rio Janeiro.
*D. Smith McCauley, late U. S. Consul-General at Tripoli, Philadelphia.
*Hon. Isaac McKim, late President of the Horticultural Society of Maryland, Baltimore.
Rev. James H. Means, Dorchester, Mass.
*James Mease, M. D., Philadelphia.
*Lewis John Mentens, Brussels, Belgium.
*Hon. Charles F. Mercer, Virginia.
*François André Michaux, Paris.
Donald G. Mitchell, New Haven, Conn.
*Samuel L. Mitchill, M. D., LL.D., New York.

*Hon. James Monroe, late President of the United States, Oak Hill, Va.
*Alfred S. Monson, M. D., late President of the New Haven Horticultural Society, New Haven, Conn.
*Hon. A. N. Morin, Montreal, Canada.
*Théodore Mosselmann, Antwerp, Belgium.
Baron R. Von Osten Sacken, Heidelberg, Germany.
*Baron Ottenfels, late Austrian Minister to the Ottoman Porte.
*John Palmer, Calcutta.
*Hon. Joel Parker, LL. D., Cambridge.
Samuel B. Parsons, Flushing, N. Y.
*Hon. Thomas H. Perkins, Brookline.
*Antoine Poiteau, late Professor in the Institut Horticole de Fromont.
*Hon. James K. Polk, late President of the United States, Nashville, Tenn.
*John Hare Powel, Powelton, Pa.
*Henry Pratt, Philadelphia.
*William Prince, Flushing, N. Y.
*Rev. George Putnam, D. D., Roxbury.
*Col. Joel Rathbone, late President of the Albany and Rensselaer Horticultural Society, Albany, N. Y.
*Archibald John, Earl of Rosebery, late President of the Caledonian Horticultural Society.
*Joseph Sabine, late Secretary of the Horticultural Society of London.
*Don Ramon de la Sagra, Havana, Cuba.
*Henry Winthrop Sargent, Fishkill, N. Y.
*Sir Walter Scott, Abbotsford, Scotland.
*John Shepherd, late Curator of the Botanic Garden, Liverpool, England.
*John S. Skinner, late Editor of the American Farmer, Baltimore, Md.
George W. Smith, Boston.
*Stephen H. Smith, late President of the Rhode Island Horticultural Society.
*Hon. Charles Sumner, Boston.
*Hon. John Taliaferro, Virginia.
*Gen. James Talmadge, late President of the American Institute, New York.
*Gen. Zachary Taylor, late President of the United States, Baton Rouge, La.
*James Thacher, M. D., Plymouth.
John J. Thomas, Union Springs, N. Y.
*James W. Thompson, M. D., Wilmington, Del.
*Grant Thorburn, New York.
*M. Du Petit Thouars, Paris.
*Le Vicomte Héricart De Thury, late President of the Horticultural Society of Paris.
*Mons. Tougard, late President of the Horticultural Society of Rouen, France.
*Gen. Nathan Towson, late President of the Horticultural Society, Washington, D. C.

*Hon. John Tyler, late President of the United States, Williamsburg, Va.
*Rev. Joseph Tyso, Wallingford, Eng.
*Hon. Martin Van Buren, late President of the United States, Kinderhook, N. Y.
*Federal Vanderburg, M. D., New York.
*Jean Baptiste Van Mons, M. D., Brussels, Belgium.
*Gen. Stephen Van Rensselaer, Albany, N. Y.
*Joseph R. Van Zandt, Albany, N. Y.
*Benjamin Vaughan, M. D., Hallowell, Me.
*Petty Vaughan, London.
*Rev. N. Villeneuve, Montreal, Canada.
*Pierre Philippe André Vilmorin, Paris.
*James Wadsworth, Geneseo, N. Y.
*Nathaniel Wallich, M. D., late Curator of the Botanic Garden, Calcutta.
*Malthus A. Ward, M. D., late Professor in Franklin College, Athens, Ga.
*Hon. Daniel Webster, Marshfield.
*Hon. John Welles, Boston.
*Jeremiah Wilkinson, Cumberland, R. I.
Hon. Robert C. Winthrop, Boston.
*Frederick Wolcott, Litchfield, Conn.
*Ashton Yates, Liverpool, Eng.
*Lawrence Young, late President of the Kentucky Horticultural Society, Louisville.

CORRESPONDING MEMBERS.

Members and Correspondents of the Society and all other persons who may know of deaths, changes of residence, or other circumstances showing that the following list is inaccurate in any particular, will confer a favor by promptly reporting to the Secretary the needed corrections.

Information, or any clew to it, is especially desired in regard to Alexander Burton, *elected in* 1829, S. Reynolds, M. D., 1832, *and* Francis Summerest, 1833. *The names of those known to be deceased are marked with a star.*

*John Adlum, Georgetown, D. C.

*Don Francisco Aguilar y Leal, late U. S. Vice-Consul at Maldonado, Banda Oriental del Uruguay.

*Mons. Alfroy, Lieusaint, France.

*James T. Allan, late President of the Nebraska State Horticultural Society, Omaha.

A. B. Allen, New York.

*Rev. Thomas D. Anderson, D. D., South Boston.

Édouard André, Redacteur en chef de la Revue Horticole, Paris, France.

*Thomas Appleton, late U. S. Consul at Leghorn, Italy.

*Col. Thomas Aspinwall, late U. S. Consul at London, Brookline.

P. M. Augur, State Pomologist, Middlefield, Conn.

Professor L. H. Bailey, Jr., Cornell University, Ithaca, N. Y.

*Isaac Cox Barnet, late U. S. Consul at Paris.

Patrick Barry, Ex-First Vice-President of the American Pomological Society, Rochester, N. Y.

*Augustine Baumann, Bolwiller, Alsace.

*Eugéne Achille Baumann, Rahway, N. J.

*Joseph Bernard Baumann, Bolwiller, Alsace.

Napoleon Baumann, Bolwiller, Alsace.

D. W. Beadle, St. Catherine's, Ontario.

Professor William J. Beal, Lansing, Michigan.

*Noel J. Becar, Brooklyn, N. Y.

*Edward Beck, Worton College, Isleworth, near London.

*Rev. Henry Ward Beecher, Peekskill, N. Y.

*Louis Édouard Berckmans, Rome, Ga.

Prosper J. Berckmans, Augusta, Ga.

Charles E. Bessey, Ph. D., Industrial College of the University of Nebraska, Lincoln, Neb.

*Alexander Bivort, late Secretary of the Société Van Mons, Fleurus, Belgium.

*Tripet Le Blanc, Paris.

Dr. Ch. Bolle, Berlin, Prussia.
*Charles D. Bragdon, Pulaski, Oswego Co., N. Y.
*William D. Brincklé, M. D., Philadelphia.
*George Brown, late U. S. Commissioner to the Sandwich Islands, Beverly.
*John W. Brown, Fort Gaines, Ga.
*Dr. Nehemiah Brush, East Florida.
*Arthur Bryant, Sr., late President of the Illinois State Horticultural Society, Princeton.
Professor J. L. Budd, Secretary of the Iowa Horticultural Society, Ames.
*Robert Buist, Philadelphia.
*Dr. E. W. Bull, Hartford, Conn.
William Bull, Chelsea, England.
*Rev. Robert Burnet, Ex-President of the Ontario Fruit Growers' Association, Milton.
Alexander Burton, United States Consul at Cadiz, Spain, Philadelphia.
Isidor Bush, Bushberg, Jefferson Co., Mo.
George W. Campbell, Delaware, Ohio.
*Francis G. Carnes, New York.
*Col. Robert Carr, Philadelphia.
*Rev. John O. Choules, D. D., Newport. R. I.
*Rev. Henry Colman, Boston.
*James Colvill, Chelsea, England.
Maxime Cornu, Directeur du Jardin des Plantes, Paris, France.
Benjamin E. Cotting, M. D., Boston.
*Samuel L. Dana, M. D., Lowell.
*J. Decaisne, late Professeur de Culture au Muséum d'Histoire Naturelle, Jardin des Plantes, Paris.
*James Deering, Portland, Me.
*H. F. Dickehut.
*Sir C. Wentworth Dilke, Bart., London.
*Hon. Allen W. Dodge, Hamilton.
Rev. H. Honywood D'Ombrain, Westwell Vicarage, Ashford, Kent, England.
Robert Douglas, Waukegan, Illinois.
*Andrew Jackson Downing, Newburg, N. Y.
*Charles Downing, Newburg, N. Y.
W. T. Thiselton Dyer, C.M.G., F.R.S., Director of the Royal Botanic Gardens, Kew, England.
Parker Earle, President of the American Horticultural Society, Cobden, Ill.
*F. R. Elliott, late Secretary of the American Pomological Society, Cleveland, Ohio.
George Ellwanger, Rochester, N. Y.
Henry John Elwes, F.L.S., F.Z.S., Preston Hall, Cirencester, England.
*George B. Emerson, LL. D., Winthrop.
*Ebenezer Emmons, M. D., Williamstown.
*Andrew H. Ernst, Cincinnati, O.

William G. Farlow, M. D., Professor of Cryptogamic Botany, Harvard University, Cambridge, Mass.

*Nathaniel Fellows, Cuba.

*Henry J. Finn, Newport, R. I.

*Willard C. Flagg, late Secretary of the American Pomological Society, Moro, Ill.

*Michael Floy, late Vice-President of the New York Horticultural Society, New York City.

*John Fox, Washington, D. C.

*Hon. Russell Freeman, Sandwich.

Andrew S. Fuller, Ridgewood, N. J.

*Henry Weld Fuller, Roxbury.

Hon. Robert W. Furnas, President of the Nebraska State Horticultural Society, Brownville.

*Augustin Gande, late President of the Horticultural Society, Department of the Sarthe, France.

*Robert H. Gardiner, Gardiner, Me.

*Benjamin Gardner, late U. S. Consul at Palermo, Sicily.

*Capt. James T. Gerry, U. S. Navy.

Charles Gibb, Corresponding Secretary of the Fruit Growers' Association, Abbotsford, Quebec.

*Abraham P. Gibson, late U. S. Consul at St. Petersburg.

*R. Glendinning, Chiswick, near London.

Professor George L. Goodale, Cambridge.

Charles A. Goessmann, Ph. D , Director of the State Agricultural Experiment Station, Amherst, Mass.

*George W. Gordon, late U. S. Consul at Rio Janeiro, Boston.

*Professor Asa Gray, Cambridge.

Obadiah B. Hadwen, Ex-President of the Worcester County Horticultural Society, Worcester.

*Charles Henry Hall, New York.

*Abraham Halsey, late Corresponding Secretary of the New York Horticultural Society, New York.

*Dr. Charles C. Hamilton, late President of the Fruit Growers' Association and International Show Society of Nova Scotia, Cornwallis.

*Rev. Thaddeus Mason Harris, D. D., Dorchester.

*Thaddeus William Harris, M. D., Cambridge.

*John Hay, late Architect of the Caledonian Horticultural Society.

*Bernard Henry, late U. S. Consul at Gibraltar, Philadelphia.

Dr. F. M. Hexamer, Editor of the American Agriculturist, New Rochelle, N. Y.

Shirley Hibberd, Editor of the Gardeners' Magazine, London.

*J. J. Hitchcock, Baltimore.

Robert Hogg, LL. D., Editor of the Journal of Horticulture, London.

*Thomas Hogg, New York.

Thomas Hogg, New York.

J. C. Holding, Ex-Treasurer and Secretary of the Cape of Good Hope Agricultural Society, Cape Town, Africa.

Rev. S. Reynolds Hole, Rochester, England.
Sir Joseph Hooker, K. C. S. I., The Camp, Sunningdale, England.
Josiah Hoopes, West Chester, Pa.
Professor E. N. Horsford, Cambridge.
J. Host, Superintendent of the Botanic Garden, Trinidad.
*Sanford Howard, Chicago, Ill.
*Dr. William M. Howsley, late President of the Kansas State Horticultural Society, Leavenworth.
*Isaac Hunter, Baltimore, Md.
*Isaac Hurd, Cincinnati, Ohio.
George Husmann, Napa, Cal.
*Professor Isaac W. Jackson, Union College, Schenectady, N. Y.
*Thomas P. James, Cambridge.
*Edward Jarvis, M. D., Dorchester.
John W. P. Jenks, Middleborough.
William J. Johnson, M. D., Fort Gaines, Ga.
Charles Joly, Vice-President of the Société d'Horticulture de France, Paris.
Dr. George King, Superintendent of the Royal Botanic Garden, Calcutta.
*Samuel Kneeland, M. D., Boston.
*Mons. Laffay, St. Cloud, near Paris, France.
*David Landreth, late Corresponding Secretary of the Pennsylvania Horticultural Society, Bristol, Pa.
*Charles C. Langdon, Mobile, Alabama.
Professor William R. Lazenby, Secretary of the Agricultural Experiment Station, Columbus, Ohio.
*Dr. William LeBaron, late State Entomologist, Geneva, Ill.
Max Leichtlin, Baden-Baden, Germany.
G. F. B. Leighton, President of the Norfolk Horticultural and Pomological Society, Norfolk, Va.
Victor Lemoine, Nancy, France.
*E. S. H. Leonard, M. D., Providence, R. I.
*André Leroy, Author of the Dictionnaire de Pomologie, Angers, France.
J. Linden, Ghent, Belgium.
*Hon. George Lunt, Scituate.
T. T. Lyon, President of the Michigan Horticultural Society, Grand Haven.
*F. W. Macondray, San Francisco, Cal.
Dr. P. MacOwan, Director of the Botanic Garden, Cape Town, Africa.
*James J. Mapes, LL. D., Newark, N. J.
*A. Mas, late President of the Horticultural Society, Bourg-en-Bresse, France.
Dr. Maxwell T. Masters, Editor of the Gardeners' Chronicle, London.
*James Maury, late U. S. Consul at Liverpool, England.
George Maw, Benthall, Kinley, Surrey, England.
C. J. de Maximowicz, St. Petersburg, Russia.
T. C. Maxwell, Geneva, N. Y.
*William Sharp McLeay, New York.

*James McNab, late Curator of the Botanic Garden, Edinburgh, Scotland.
Thomas Meehan, Germantown, Pa.
*Allan Melvill, New York.
*John Miller, M. D., late Secretary of the Horticultural and Agricultural Society of Jamaica.
*Stephen Mills, Flushing, N. Y.
*Charles M'Intosh, Dalkeith Palace, near Edinburgh.
*Joseph E. Mitchell, late President of the Pennsylvania Horticultural Society, Philadelphia.
Dr. Charles Mohr, Mobile, Alabama.
*Giuseppe Monarchini, M. D., Canea, Isle of Candia.
*Édouard Morren, Editor of the Belgique Horticole, Liège, Belgium.
D. Morris, F.L.S., Assistant Director of the Royal Botanic Gardens, Kew, England.
Ch. Naudin, Antibes, France.
*Horatio Newhall, M. D., Galena, Ill.
George Nicholson, Curator of the Royal Botanic Gardens, Kew, England.
*David W. Offley, late U. S. Consular Agent at Smyrna, Turkey.
*James Ombrosi, late U. S. Consul at Florence, Italy.
*John J. Palmer, New York.
*Victor Paquet, Paris.
*John W. Parker, late U. S. Consul at Amsterdam, Holland.
*André Parmentier, Brooklyn, N. Y.
William Paul, Waltham Cross, London, N.
*Sir Joseph Paxton, M. P., Chatsworth, England.
*John L. Payson, late U. S. Consul at Messina, Sicily.
Professor D. P. Penhallow, Director of the Botanic Garden, Montreal, Canada.
*Com. Matthew C. Perry, U. S. Navy, Charlestown.
*David Porter, late U. S. Chargé d' Affaires at the Ottoman Porte, Constantinople.
*Alfred Stratton Prince, Flushing, N. Y.
*William Robert Prince, Flushing, N. Y.
P. T. Quinn, Newark, N. J.
*Rev. W. F. Radclyffe, London, England.
*William Foster Redding, Baltimore, Md.
D. Redmond, Ocean Springs, Miss.
Dr. Edward Regel, St. Petersburg, Russia.
S. Reynolds, M. D. Schenectady, N. Y.
*John H. Richards, M. D., Illinois.
Dr. T. G. Richardson, University of Louisiana, New Orleans, La.
Charles V. Riley, Entomologist to the U. S. Department of Agriculture, Washington, D. C.
*Mons. J. Rinz, Jr., Frankfort-on-the-Main, Germany.
*Thomas Rivers, Sawbridgeworth, Herts, England.
William Robinson, Editor of The Garden, London.
*Bernhard Roeser, M. D., Bamberg, Bavaria.

*Dr. J. Smith Rogers, New York.
*Capt. William S. Rogers, U. S. Navy.
*Thomas Rotch, Philadelphia.
*George R. Russell, Roxbury.
John B. Russell, Indianapolis, Ind.
*Rev. John Lewis Russell, Salem.
William Saunders, Department of Agriculture, Washington, D. C.
*William Shaler, late U. S. Consul-General at Havana, Cuba.
*Henry Shaw, St. Louis, Missouri.
*William Shaw, New York.
*Caleb R. Smith, Burlington, N. J.
*Daniel D. Smith, Burlington, N. J.
*Gideon B. Smith, late Editor of the American Farmer, Baltimore, Md.
*John Jay Smith, Germantown, Penn.
*Horatio Sprague, late U. S. Consul at Gibraltar.
Robert W. Starr, Port William, Nova Scotia.
Dr. Joseph Stayman, Leavenworth, Kansas.
*Capt. Thomas Holdup Stevens, U. S. Navy, Middletown, Conn.
William A. Stiles, Editor of Garden and Forest, Deckertown, N. J.
*William Fox Strangeway, late British Secretary of Legation at Naples, Italy.
Dr. J. Strentzel, Martinez, Cal.
*Judge E. B. Strong, Rochester, N. Y.
*James P. Sturgis, Canton, China.
William Summer, Pomaria, S. C.
Francis Summerest.
*Professor Michele Tenore, late Director of the Botanic Garden at Naples, Italy.
*James Englebert Teschemacher, Boston.
*Robert Thompson, Chiswick, near London.
*George C. Thorburn, New York.
Professor George Thurber, Editor of the American Agriculturist, New York.
*John Tilson, Jr., Edwardsville, Illinois.
*Cav. Doct. Vincenzo Tineo, late Director of the Botanic Garden at Palermo.
Dr. Melchior Treub, Director of the Botanic Garden, Buitenzorg, Java.
*Luther Tucker, late Editor of the Cultivator, Albany, N. Y.
*Carey Tyso, Wallingford, England.
*Louis Van Houtte, Ghent, Belgium.
*Alexander Vattemare, Paris.
H. J. Veitch, Chelsea, England.
Henry Vilmorin, Secretaire de la Société Nationale d'Agriculture de France, Paris.
*Emilien de Wael, late Secretary of the Horticultural Society, Antwerp, Belgium.
*John A. Warder, M. D., late President of the Ohio State Horticultural Society, North Bend, Ohio.

Anthony Waterer, Knapp Hill, near Woking, Surrey, England.
Sereno Watson, Ph. D., Cambridge, Mass.
*J. Ambrose Wight, late Editor of the Prairie Farmer, Chicago, Ill.
Benjamin Samuel Williams, Upper Holloway, London, N.
*Professor John Wilson, Edinburgh University, Scotland.
*William Wilson, New York.
*Hon. J. F. Wingate, Bath, Me.
*Gen. Joshua Wingate, Portland, Me.
*Joseph Augustus Winthrop, Charleston, S. C.

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